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PHYSICAL EXAMINATION AND TRAINING OF CHILDREN



CHARLES KEEN TAYLOR



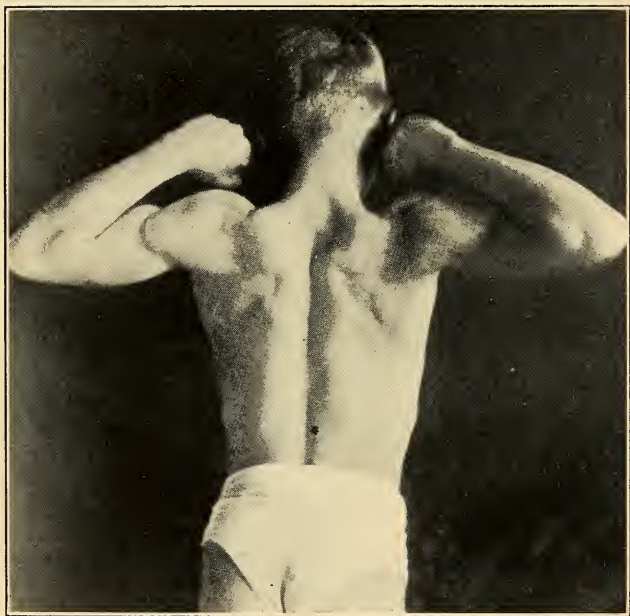
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**PHYSICAL EXAMINATION AND TRAINING
OF CHILDREN**



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THE PHYSICAL EXAMINATION AND TRAINING OF CHILDREN

A HANDBOOK, FOR SCHOOL MEDICAL
INSPECTORS, PHYSICAL DIRECTORS,
TEACHERS, AND PARENTS.

BY

CHARLES KEEN TAYLOR, B.S., M.A.

*Author of "Character Development," "The Moral Education of
School Children," etc., etc.*

PHILADELPHIA

THE JOHN C. WINSTON COMPANY

1914

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To
WILLIAM S. STECHER, B.S.G.,
DIRECTOR OF PHYSICAL EDUCATION IN THE PHILADELPHIA
PUBLIC SCHOOLS, AS A SLIGHT MARK OF APPRECIATION OF
HIS SPLENDID SERVICE TO THE SCHOOL CHILDREN OF
PHILADELPHIA.

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INTRODUCTION

There is ground for encouragement in the outlook for the race in the more rational modes of living that each year are coming more and more into vogue. In no way is this improvement better evidenced than in the stress being laid upon physical training and particularly upon physical training in the formative period of life. At this time much can be accomplished in the all-round development of the growing child, and in the correction of those deficiencies, which, if allowed to go uncorrected, result in a fixed deformity, constituting a pronounced handicap in the struggle for existence.

Medical inspection of school children, originally designed simply to prevent the spread of infectious diseases, like all other reforms, has developed far beyond the original lines mapped out by those who instituted it. The author of this book takes advanced ground, and, in a very practical way, shows himself a pioneer in the movement for child-development.

The book is really a compend for the use of school medical inspectors, physical directors, teachers, parents and those concerned at all with the physical well-being of children. Even a

cursory reading of its pages must impress one with what has been done and what can be done in the removal of apparently hopeless disabilities.

The subject of sex hygiene, although approached only by inference, seems to be dealt with in an intensely practical way, as lectures upon such a subject require most dextrous handling to avoid doing more harm than good.

There is no intention on the part of the writer to present a medical treatise upon the various nervous affections met with in childhood. He simply directs attention to their most striking symptoms, in order to insure early recognition of the condition.

The entirely new system of anthropometry is a distinct advantage. It is recognized among medical men that actual and physiological age are separate and distinct. Standardizing measurements according to "age" would seem to be an anachronism. The plan adopted by the author is a much more rational and usable system.

The book should commend itself to every lover of children and to every one who believes in and is working for the upbuilding of the race.

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THE PHYSICAL EXAMINATION

CHAPTER I

The Physical Examination

A thorough physical examination can be made only by an experienced physician, but there are a number of physical characteristics which should be noticed at once, not only by the usual physical examiner or gymnastic instructor, but by the school teacher as well—not to speak of the parent. Let us consider the more important of these.

Carriage

When one sees a child, the carriage is nearly always the first thing noticed. A normal, healthy child should hold his or her head erect, the shoulders back, though in an unstrained manner, and the chest well rounded. The body should be held naturally erect, with level shoulders and unsagging abdomen.

Unfortunately many children, from one cause or another, do not carry themselves well. With a number the head is likely to hang forward in a dispirited manner. With the hanging head usually come stoop shoulders, and, in consequence, flat chest and protruding abdomen. Sometimes, too, the upper part of the back seems

to be bent forward in a sharp curve, and not infrequently one shoulder is distinctly higher than the other. These faults are generally easy to see, whether the child is seated or standing.

Sometimes, too, a child, instead of standing erect, will invariably lean against the nearest object, or as invariably stand upon one certain foot. At this time another fault is not infrequently noticed, and that is that the arch of the foot has broken, resulting in flat-foot.

These, then, are the more common faults which affect the carriage of a child. It is well to consider them in detail.

Hanging head may indicate one or more of several things, among which are weak musculature, malnutrition, under-feeding, and defective eyes. Perhaps the most common cause is weak musculature, and this, of course, may in turn be due to lack of exercise, unhealthy surroundings, or scanty or improper diet.

Stooping or round shoulders and flat chest generally accompany the hanging head. The musculature may be again at fault, though another very important cause may be at the bottom of it. A serious nasal obstruction, such as may be produced by the common *adenoid*, can occasion this whole series of faults—the flat chest, because breathing is difficult; round shoulders, because the chest is flat and undeveloped; and

hanging head, because the presence of adenoids with flat chest and round shoulders generally means physical weakness and lack of stamina.

These faults bring on other faults. When the head and shoulders hang forward, and difficult breathing causes under-development of the lungs, then the upper part of the breast-bone is depressed. The ribs are deflected downward to an abnormal degree. Thus the chest is made flat, especially in the upper part, causing more or less of a restriction of the lungs, and sometimes even of the heart. A matter for serious consideration is the fact that tuberculosis generally begins in this restricted area

Naturally such a condition in the chest would tend to crowd downward the abdominal organs, causing the abdomen to protrude, and sometimes bringing on disturbances of the crowded organs. It is thus easy to see that the hanging head, round shoulders, flat chest, and protruding abdomen are likely to go together, and that when they do it is an indication of a condition that may be, or may become, quite serious. A child showing such a combination of characteristics, or even one of them, should be sent to a physician for expert examination.

When a child has one shoulder higher than the other, the cause is sometimes found to be a spinal curvature, which may be very slight, but not less

important on that account. This defect is far more common than is supposed, especially among girls, and possibly much of the blame may be laid at the doors of our common-school seating arrangements. Of course there are often physical conditions which seem to encourage the development of curvature; but the usual school desk and seat have much to answer for, not in themselves so much as in their lack of adjustment or mal-adjustment. The writer has seen class-rooms, even in expensive private schools, in which all the desks and seats were of the same height from the floor, so that the large boys could hardly get their knees under their desks and had to twist their bodies in order to get into a writing position, while the little fellows had their feet raised above the floor and, in order to write, had to lift their right shoulders awkwardly. Either condition is likely to favor the beginning of a curvature, and a curvature once begun is most difficult to overcome.

Therefore, when the position of a child's shoulders seems to indicate the presence of curvature, examine for curvature at once, or have some expert do so; and in the meantime see how that child is seated. His feet should reach the floor, and the bench, which ought to come rather well forward, should give support to the leg nearly to the knee-joint. The height of the desk

should be such that the child can place his forearms upon it, almost to the elbows, without leaning forward. In fact, the desk-top should come far enough backward to prevent altogether any undue leaning forward.

Proper seating conditions will encourage the taking of a proper seating posture, besides which the child should be instructed concerning the values of correct position when seated, standing, or walking—a matter too frequently neglected in our schools, public and private. We need not take up here a discussion concerning the effects of sitting too long before desks in the usual school-room. We are beginning, at last, to realize that the healthy normal child is a restless creature, and that though the class-room gives a valuable self-control, this restlessness should be given fairly frequent opportunity for expression. The class-room seat and desk entirely too often are required to act as a straight-jacket!

Flat-foot is another defect that may be noticed, usually, at a glance. This condition is usually present when there seems to be no arch to the instep. This fault is often brought about by muscular weakness or by bad shoes, but sometimes seems to appear during a period of excessive growth. Tight, badly-shaped shoes, which do not allow the foot to conform to its natural shape and which restrict the natural movements

of the foot when walking, are likely to cause the foot to turn outward, whereas, in walking or running the foot naturally tends to point straight ahead, or even a little inward. When the shape of a shoe prevents the foot from taking this natural position, actually encouraging it to turn more and more outward, then the weight of the body is not carried by the parts best fitted for it, and thus arises a strong likelihood that the arch will be broken. This, however, does not take place before the development of a considerable amount of pain in the foot, calf, or even in the back. Therefore we can look upon these signs as timely warnings.

Summary of Points Concerning Carriage

Common Faults

1. Hanging head.

2. Stoop shoulders and flat chest.

3. Protruding abdomen.

Common Causes

Weak musculature, malnutrition, underfeeding, defective eyes.

Weak musculature due to one or more of several causes; or difficulty in breathing, caused by adenoids, for example.

Generally present with flat chest and round shoulders, sometimes indirectly caused by them, but often caused by some serious digestive difficulty.

Common Faults

4. Shoulders at unequal heights, twisting of the body or abnormal bending of the spine.

5. Flat-foot.

Common Causes

Generally a sign of spinal curvature, which may be brought on by continued bad posture, or may be the result of a much more serious cause.

May be brought on by muscular weakness or by badly fitting or badly shaped shoes.

Procedure

When any of these faults appear, there should be a prompt and expert examination, and the actual cause determined. It is quite useless, as well as unreasonable, to blame a child for taking a bad posture, for not "sitting up straight," for instance, when the bad position is caused by a physical defect. In all cases, the child's parents should be notified and persuaded to assist in remedial measures.

Facial Characteristics

It is only by putting together a great number of indications and signs that one is able to approach a reliable physical diagnosis. Characteristics noted in a child's posture or carriage may *seem* to indicate certain conditions, but by no means can they be relied upon in themselves. They must be considered in connection with other signs, and even then too great caution cannot be

exercised in forming conclusions. If a child's carriage or posture is likely to be the first noticeable quality, the face is certain to be the second, and from a child's face much of value can be learned concerning the physical condition.

The nose may possess one or more of several common faults, the presence of one of which may not have a great deal of meaning. But when they occur along with other facial abnormalities, we have occasion to be suspicious. Common faults are these: unnaturally broad bridge, thickened base, unusually small nostrils, a rather "puffy" appearance, evidences of a chronic "cold," and malodorous breath. One or more of these conditions may indicate that there is a stoppage of some kind in the nasal passages, and the most common kind of stoppage is caused by abnormal growths of adenoid tissue. But the appearance of the nose alone is not sufficient to warrant any decision. However, most of these appearances are more or less connected with manifestations elsewhere, so a consideration of the latter is valuable. The mouth is a great aid in this respect.

The commonest faults that appear in the mouth are these: open mouth or mouth-breathing, irregularly placed teeth, over-lapping front teeth, weak lower jaw, receding or small chin, V-shaped upper jaw, high-arched palate, and enlarged ton-

sils. Decayed teeth are often very important factors.

All but the last two faults have generally the same cause: that is, some nasal obstruction that encourages or brings on mouth-breathing. As has been said, the most usual cause of nasal obstruction is the adenoid, and the adenoid may bring on the appearance of one or more of these faults.

If it is difficult to breathe through the nose, then naturally a child—or anyone else—will breathe through the mouth. When this becomes habitual with a growing child, the roof of the mouth often arches abnormally upward, bringing the sides of the jaw together so that the jaw itself becomes V-shaped. This in turn causes the teeth to overlap, because there is not room enough for them to place themselves normally. Because the lower jaw hangs open, it becomes weak, and sometimes becomes unnaturally small, or actually recedes.

All this brings on other bad effects. For instance, because the jaws do not meet normally, when brought together, the food is insufficiently masticated, and thence may come both chronic indigestion and constipation.

When the mouth presents the appearance as described, and when, in addition, the nose is also of the adenoid type, then we can feel fairly

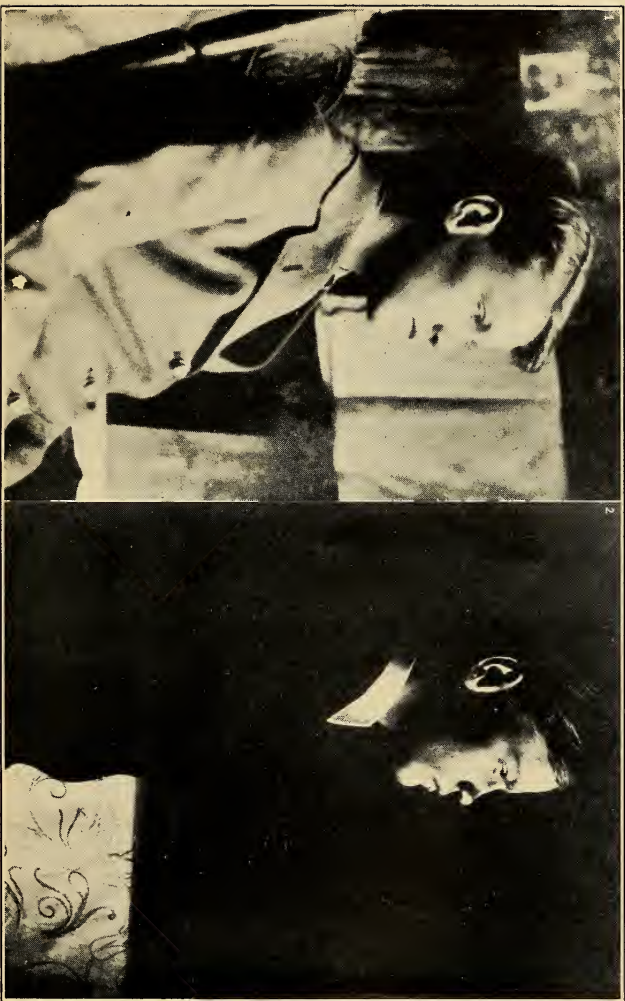
sure that adenoids are at the root of the trouble. If, with these conditions, are present the hollow or flat chest, round shoulders with consequent projecting shoulder-blades, and very poor breathing powers, then we can feel quite certain. In any case, even where there is only suspicion, an examination by a physician should be made.

With all these indications of enlarged adenoids, there are sometimes several others. There may be a stupid "look," often actual stupidity, frequent "colds," a nasal voice, pale face, and dull-looking eyes. Also, a child who has adenoids usually snores. Still another indication may be trouble with the ears or with the hearing. There may be actual ear-ache, or discharges from the ears, or partial deafness of more or less severity. A child having such troubles may be reprimanded frequently for inattention, when the fact is that the child does not hear more than half, and perhaps not even that.

Let it be understood that it does not take the appearance of all these faults to make one suspicious of the presence of adenoids. Almost any one of them should be deemed sufficient to occasion expert examination.

Enlarged tonsils, which frequently accompany adenoids, should also be looked for when examining the mouth.

Perhaps you would next notice the eyes of a



ADENOID CASE BEFORE AND AFTER TREATMENT. NOTE DIFFERENCE IN POSTURE AND EXPRESSION.

child. The more common faults are these: "squint," blink, redness of the eye, inflammation of the lids, twitching, cross-eye or strabismus, divergent eyes, hanging head and avoidance of light.

By many the "cross-eye" has been considered almost a "natural" condition. The fact is, however, that it is one of no little seriousness, for the deflected eye frequently becomes almost if not quite blind; yet the condition can be greatly improved by early attention. As soon as this condition is noticed, the child should be taken to an oculist, who may be able in great measure to do away with the defect.

It is also very important to notice at once any inflammation of the eye or of the lids, for there are several only too common diseases which make their appearance in this manner. The other faults are generally the result of some defect in the mechanism of the eye itself, that is, such faults as blinking, twitching, straining, and the like. If, when a child reads, he holds his book at some very unusual length, this too is a similar indication, and should, as with the others, lead to an examination by a competent oculist.

Indications of eye-strain, however, are not limited to the eye itself, as frequent contraction of the brows, or a continual frown, may likewise be taken as important considerations. Again, there may be no visible sign, but a child, in read-

ing, may make such absurd mistakes, by mispronouncing easy words, omitting others, and adding still others, that instead of condemning the child for carelessness, it would be well to have the vision tested; for some fault is likely to be at the bottom of the bad reading.

So much depends upon the well-being of the eyes that too much care can hardly be used in observing them. Eye defects are common causes of headache, nervousness, irritableness, or downright bad temper or incorrigibility. They are very often the cause of a seeming backwardness or dullness. The writer has examined many children supposed to be abnormally backward who were able to distinguish words or even letters only with the greatest difficulty. Proper treatment, or proper glasses, may make a seemingly stupid child into a normally bright one, or a cross, irritable child into a happy, cheerful one. Such treatment will frequently alter a child's whole disposition for the better. Badness is quite often the result of some physical strain, and among these there are few more common than that caused by defective eyes.

We need hardly mention the teeth specifically. It is well known that decay affects the digestive organs not only through the constant swallowing of the products of the decay, but also because, ultimately, the food is improperly and insuffi-

ciently masticated. This latter also happens when the teeth are badly adjusted so that they are unable to perform their functions properly. Not only so, but the constant irritation caused by bad teeth may drive a good-natured child almost into incorrigibility.

Summary for Points Concerning the Face

Common Faults

1. The nose. Broad, flat bridge; thick base; very small nostrils; puffy appearance; malodorous breath.

2. The mouth. Open mouth, mouth-breathing, irregular teeth, over-lapping front teeth, weak lower jaw, receding lower jaw, high-arched palate.

3. The ears. Ear-ache, discharge, partial deafness.

4. The eyes. (a) Twitching, blinking, hanging head, reading at unnatural distances, inward or outward strabismus.

(b) Redness of the eye. Inflammation of any kind.

5. The teeth. Decay.

Common Causes

Chronic stoppage of some kind, probably caused by enlarged adenoids, or by a chronic catarrhal condition.

Nasal obstruction, probably caused by adenoids; enlarged tonsils often accompanying adenoids.

Sometimes caused by conditions developing with enlarged adenoids or tonsils or accompanying inflammations.

(a) Faulty mechanism of the eye, calling for services of an oculist.

(b) May be caused by the presence of some dangerous contagious disease.

Lack of attention, or effect of certain diseases.

Procedure

When any of the clear indications of adenoids or other nasal stoppage is present, examination by a physician is in order, as is also the case when contagious diseases of the eye are considered. When faulty eye-mechanism is in evidence, then the advice of an oculist should be had without delay. Decayed teeth should occasion not only a prompt visit to the dentist, but also careful instruction as to the care of teeth.

It is hardly the place of this book to go deeply into the eye and ear tests. A Snellen Chart is useful in obtaining a rough judgment as to the fitness of the eyes, being careful to cover the eye not in use, and to see that the chart is well lighted. A simple way of testing for hearing is to stand behind the subject with a soft-ticking watch. Have the child's eyes blindfolded. Bring the watch slowly towards one ear, telling the child to speak as soon as the watch is heard, indicating which ear is nearest the watch. Try the experiment a number of times, and do not test the ears alternately, but try the same ear twice or even three times in succession, and so break the order that the child cannot guess which ear you are testing. Note the distances at which the child hears the watch with either ear. If there is a great difference in distance, you can feel sure there is some marked fault. You should

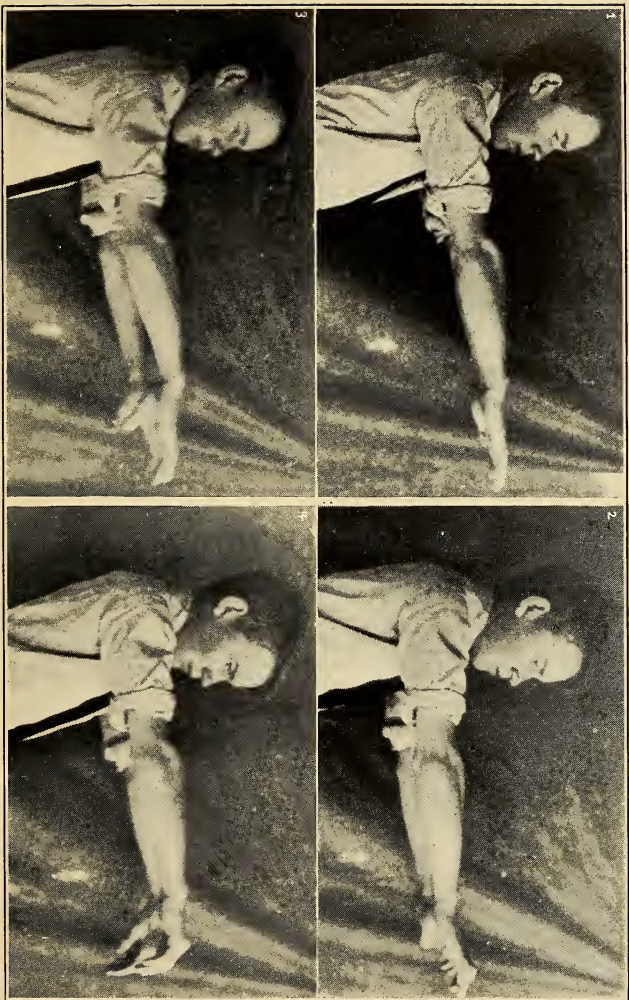
have your watch tested by a number of seemingly normal children so that you can have some judgment as to how far from the ear it can generally be heard.

The Hands

Several facts can be noticed by even a brief examination of a child's hands. For instance, in shaking hands with a child, it can be noticed if the hand has a normal temperature, or whether it is very dry, or hot, or cold and moist. It can be noticed whether the grip is firm and reasonably strong, or if it shows excessive, jerky, nervous strength, or is flabby and lacking in energy. At the same time you can see whether the fingernails are bitten, whether the back of the hand is red, and if it is reasonably clean or not. If the back of the hand is red, press the thumb upon it, and so leave a white mark where the pressure was exercised. In this connection it is important to note how rapidly or slowly the blood flows back again into the white area. If the hand is not clean, then it is important to judge whether it is the uncleanness of the day—and there is something the matter with a boy whose hands are always scrupulously clean!—or the uncleanness of many days, which indicates something concerning home environment—as does the proverbial “low-water mark” not infrequently visible behind the ears and along the back of the neck!

A few other points can be observed. Ask the child to extend his arms straight out before him. The four illustrations show characteristic positions which may be taken by the hands. The first shows a normal healthy condition, the hands being held straight out, strongly, but not with unnecessary vigor. The second shows a nervous type of hand. In such a case an excessive amount of nervous energy is called into action, and also into very easy, simple movements. In this case the abnormal tension distorts the hand as shown. The third type indicates that a normal amount of energy is lacking. This is shown by the drooping of the thumbs. If the child is actually tired, the thumbs will droop anyway, but if the child has no reason for being tired—physically or mentally—then the drooping of the thumbs is to be noticed, though the indication is not so important as that shown in the fourth illustration. Here the whole hand droops as though it were utterly lacking in energy. For a child physically or even mentally tired, such a position might not be made a matter for attention; but when there should be no signs of fatigue, then it should be noted as an important indication.

Some of these conditions concerning a child's hands may be not so important in themselves as adjuncts in building up a general impression of



FOUR CHARACTERISTIC POSITIONS OF HANDS.

the child. Taken in consideration with other points, hot and dry hands often indicate a feverish condition, and cold and moist hands are sometimes signs of low vitality, or sometimes, with boys, they may indicate bad habits. An excessively strong grip is often the sign of a nervous condition, which causes one to put forth, in every action, much more energy than is required. The flabby, weak hand, as might be supposed, tells of a vitality below normal from some cause or other.

Bitten finger-nails are another sign of an unhealthy nervous condition, a condition which may have been brought on by causes as diverse as eye-strain, malnutrition, and cigarette smoking.

Where the pressure of the thumb leaves a white area on the back of a red hand, we have a crude means for making a quick judgment as to the circulation. If the return of the blood is rapid, then we have a reason for thinking the circulation to be in fairly good condition any way. If, on the contrary, the white mark remains a long while, especially if the back of the hand appears not only red but more or less rough as well, then we can consider the possibility of cyanosis being present—some unhealthy condition of the vasomotor system. The other points noted about the hands explain themselves.

Summary of Points Concerning the Hands

Indications

Causes

1. Excessive energy displayed in action: in grip, and in extending the hands.

Nervous condition, which may be the result of one of many conditions.

2. Temperature: hot and dry, or cold and moist.

Feverish condition, or reduced vitality.

3. Circulation, as shown by thumb-pressure on back of hand.

Slow return of blood may indicate cyanosis.

4. Drooping of thumbs or drooping of hands when extended.

Lack of energy, caused by fatigue or by reduced vitality.

5. Marked and continued uncleanliness of hands.

Lack of care on part of parents or poor home environment.

Procedure

When any of the above signs of an unhealthy physical condition are apparent, especially when they are connected with other signs to which they add emphasis, the thing to do is to have the child examined by a physician, who may not only find the definite cause, but suggest a plan for remedial work which can be aided by certain kinds of exercise. In the case of persistent uncleanliness, the child should be given proper ideas on the subject, and the social-worker, if there is one, or "visitor," should see the child's home and parents.

Nervous Affections

A teacher is very likely to see many kinds of nervous affections in every large body of children. Although the cause is not generally to be found in the school itself, a teacher or physical instructor should be able to recognize signs of common nervous disorders and see that children having them are examined and cared for by proper authorities. The troubles of this character most common among children are stuttering and stammering, chorea, hysteria, and epilepsy. Let us consider them in order.

Stuttering and stammering, though seemingly much alike, have rather different physical conditions behind them, and are more or less readily distinguished. In stammering the child seems to have difficulty with individual sounds, while with stuttering the difficulty is more likely to be with syllables. Besides, with the latter, a kind of spasm seems to accompany the impeded utterance—a condition not evident with stammering. Furthermore, stammering is often accompanied by anomalies of the lips, the tongue, or of the articulating organs in general, while such defects are not common with stutterers. More “nervousness” underlies stuttering than stammering.

Either stammering or stuttering may be excited by overwork, undernourishment, some unusual strain or excitement, or may be the effects of a

fever, while some forms of stuttering are likely to be of hysterical origin. In such a case the general condition of the child would need attention. Such causes as have been mentioned probably lie behind temporary forms of these affections. When the trouble is more deeply seated, however, in a large percentage of cases an entire cure cannot be expected. In all cases a scientific training in speech-work, and a careful study and, if necessary, an improvement of a child's general physical condition and environment, may do much to improve the disorder.

Chorea, or St. Vitus' dance, is met with, occasionally, in the class-room, generally in some mild form. In these cases a child may seem restless, unable to hold objects for any length of time, may be excitable, may fall easily, and may make purposeless, spasmodic, or unexpected movements. Efforts to restrain these actions seem to stimulate them, excitement of the exercising of the affected muscles seeming to have the same effect. When the affection is very mild, little more may be noticed than a kind of awkwardness shown in ordinary motions and muscular actions, perhaps accompanied by uneasy bodily motions.

A child displaying any of the above symptoms should have medical attention, the teacher's and parents' part being to see that the child has

hygienic surroundings, quiet, rest, and much open-air life, as well as entire freedom from excitement.

True hysteria is so marked in its action that, like epilepsy, there is little likelihood of its existing unnoticed. A child possessing a strong tendency toward hysteria will be frequently moody and choleric or irritable. Or he will be sad and melancholy, and will be likely to shun the society of his fellows. The fits themselves generally begin with a suffocating sensation, followed by a rigidity, with consciousness much affected. Then follow spasmodic shocks and a brief repose. This is generally followed by violent shocks, then a delirium filled with sorrows and appeals, then subsidence, and the attack is at an end. This, of course, describes a serious type of attack. Many do not reach such an intensity.

The causes seem to be heredity, or some exciting cause, such as a fright or shock. Hysteria may follow an accident. Exciting or depressing emotions may bring on this affection. Fright is perhaps the most common cause for children who are predisposed to hysteria. Another cause may be "defective education," the effect showing in a child who has never been corrected, controlled, or disciplined, who has been indulged in all his caprices, and who has been allowed to develop exciting emotions by any means he has desired.

Such a child, when checked or "balked," will be likely to show signs of hysteria, if there is any predisposition towards it at all.

Right here is one of the dangers existing in so many "new" educational systems, which are built upon a false and silly sentimentality, generally by persons who are ignorant of the fact that self-control, a vitally necessary factor for happiness and success, is developed largely by means of an intelligent discipline. The discipline affecting the lives of adults is a very stern and severe one. We have to learn to accustom ourselves to the ever present "must" and "must not." Obedience comes only through long training. Allowing children to develop according to their own instincts, allowing them very largely to follow their own desires and pleasures, endeavoring to train and educate them by means of subtle persuasions, develops wilfulness instead of will-power, and egotism instead of self-control. Many a hysterical and uncontrollable child is so because of this very kind of training, or lack of training, which is bad enough when developed in the home by ignorant or weak-willed parents, and still more pernicious when actually systematized and practiced upon children by the score.

With hysteria, medical attention is likely to be necessary; but the treatment should be moral as well as physical. Moral education, of whatever

kind needed, with temporary isolation and outdoor exercise, are great aids in fighting this disorder.

Epilepsy may show itself by slight muscular spasms, of the outer eye muscles, for instance, or of a finger. Or there may be spasmodic actions of small or large muscular groups. In severe cases a child will fall to the ground with a cry, convulsed, with face at first pale and later congested; the teeth set and the hands clenched. Violent spasms are then followed by sleep, which may last several hours.

Epilepsy is not a mere motor disease, but it is an indication of serious degeneration, in most cases, of the higher intellectual spheres of the brain. Signs of the mental condition are rages, forgetfulness, moral perversions, and various delusional ideas. When the disease is chronic, there is a deterioration of the mental faculties which continues without hope of cure. Temporary affections may be brought on by various strains, such as intestinal indigestion, or eye-strain, for instance. The writer knows of a case or two undoubtedly excited by frightful school-room lighting.

When epilepsy is observed in a child, there is but one procedure, that is, immediate medical attention; and, if the case is chronic, perhaps institutional care is best.

Summary of Points Concerning Nervous Affections*Common Faults*

1. Stuttering: nervous condition, temporary or incurable.

Stammering: nervous condition, rarely curable, often accompanied with anomalies of the articulating organs.

2. Chorea: restlessness, dropping things, excitability, spasmodic purposeless movements, unusual awkwardness, irritability or too ready laughter.

3. Hysteria: moodiness, great irritability, melancholy, "fits" as described.

4. Epilepsy: slight muscular spasms, severe "fits" as described, rages, forgetfulness, mental deterioration, delusions.

Common Causes

Sometimes congenital, excited by exhaustion, excitement, or other physical affection.

Heredity, shock, some disease, such as scarlet fever.

Heredity, shock, great excitement, or defective education.

Temporary — some physical strain. Chronic — serious degeneration in brain structure.

ANTHROPOMETRY

CHAPTER II

Anthropometry

Real anthropometry is such a young science that it has not yet been decided as to the best method for tabulating the measurements of children. Its early beginnings were connected with the development of art, and ancient artists seemed more likely to consider what they thought to be "ideal" proportions of the human body than the actual proportions. This accounts for the grotesque physiques shown in much ancient sculpture developed before the Grecian period.

The greatest advance was caused indirectly by the Olympic Games. It was customary to have statues made of the winners, so that the proportions of the best athletes of Greece became a matter of close study. The existent statues of this period are certainly fine examples of natural types of men and women.

Early artists endeavored to find some part of the body which might be used as a unit of measure. The Egyptians used the length of the middle finger, deciding how many such lengths should be the proportion of any part of the body.

Albrecht Dürer, of Nuremberg, who died in 1528, developed a system in which the height was taken for unity, the length of the foot being one-sixth of this unit, the head one-seventh and so on. This artificial standard seemed faulty to Schadow, another German artist, who died in 1850. He took the measurements of a number of artists' models and from these constructed a table of proportions, and, though he used picked types, and of course a small number compared with the numbers used these days, his figures compare very favorably with those of Hastings in our own time.

In the middle of the nineteenth century, with the great interest developed in the natural sciences, there came, with the close study of the physical man, a careful study of his proportions.

The word "anthropometry" owes its origin to the man who made the first really intelligent system of measurements. This was Quetelet, who died in 1874. He not only studied human proportions generally, but endeavored to find the normal proportions of the different races. He published a table of the heights and weights of Belgian children, but the development of these measurements with age seems to follow a series quite different from figures found elsewhere, making it seem that for some of the ages Quetelet did not have a great number of subjects.

Dr. H. P. Bowditch, of Boston, and Francis

Galton, of London, developed splendid and useful systems. Galton particularly developed the scheme of grouping all the measurements of one item, say height, into percentile groups, making it easy to determine the mean, making it possible for one to tell that a certain individual, for example, excelled a certain percentage of individuals, or was excelled in turn by a certain percentage.

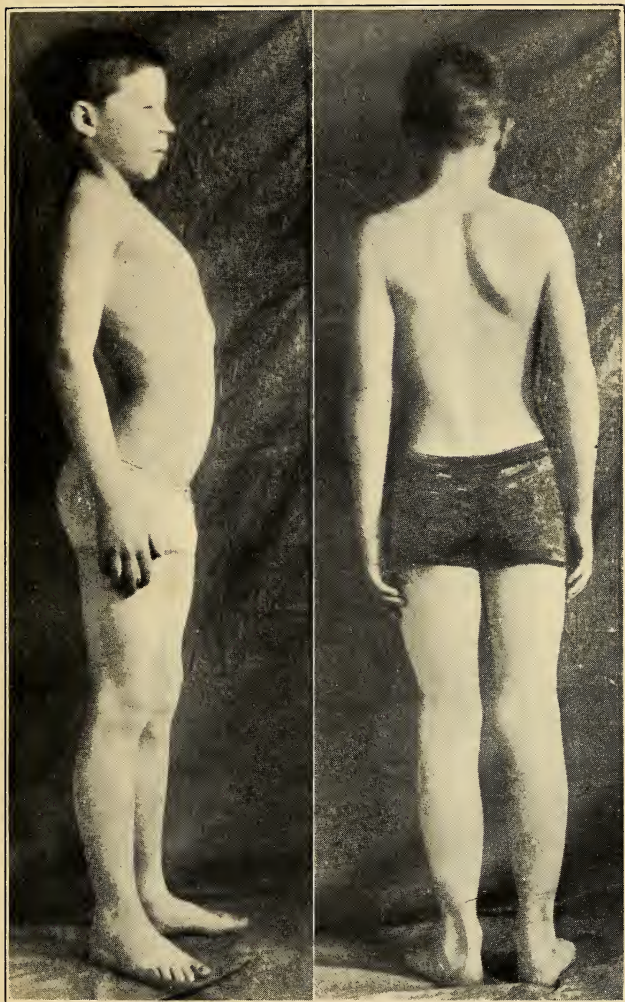
Galton's system made it possible to represent the size of a group graphically, and this is the system most usually carried out in our higher educational systems.

In 1861 Dr. Hitchcock, of Amherst, began taking the physical measurements of pupils, and educational systems generally followed his example, till now this measuring is carried out with great thoroughness by nearly all educational institutions of importance, including high schools and private academies. Therefore many tables of measurements have been compiled, perhaps the best and most useful being those of Dr. Hastings, of Springfield. His manual gives the measurements of a great number of children, from infancy upward, all arranged in the percentile form. These tables are of immense value for the quick determination of an individual's deviation from type.

Generally speaking, measurements of children

have been arranged in groups according to the chronological age of those measured, but about four years ago Dr. C. Ward Crampton, of the Department of Physical Education of the New York City Schools came to the conclusion that this system was not altogether reliable, especially through a certain span of years. The fact is that there is a great variation in measurements of children of the same age chronologically, but differing widely in physical maturity, that is, the post-pubescent children of a certain age are likely to be much larger than pre-pubescent children of the same age. So it seemed to him that an ideal system should consider the physiological age, thus making for a great and difficult complication—true though the judgment be.

But it seems to the writer that a very important point has been lost sight of. It is very evident that people do not conform to one particular type of build. There are not only racial characteristics, but distinct family characteristics. For instance, we sometimes see children who are very slender, and we find their parents slender also, or one parent, and perhaps his or her parents also. The slender type is far from being uncommon. On the other hand, the thick-set type is fairly common, too, and the variations can be seen among people of the same race. So it must be a great error to say that a child of a



PERFECT HEAVY TYPE, AGE 10. PHYSICAL STANDARD 127.
SIDE AND BACK VIEW.

certain age, physiological or chronological, should have a certain shoulder girth, or chest expansion, or the like, for the simple reason that a table of usual averages would make both the slender and thick-set types abnormal, whereas they are perfectly normal and healthy types. Of course, too, there are types that fall in between these two extremes. We might say there is a "medium" type of build, which is really an average of all the builds, and possibly 40 per cent of all children might conform to this average or medium type. Naturally we cannot consider all the intermediate variations, for to tabulate them would make the process far too cumbrous. But it is a fairly simple matter to distinguish the three obvious types—the *slender*, the *medium*, and the *heavy*—and arrange height tables for each type of physique. Chronological age tables cannot be relied on, particularly in the United States, where there is an intermingling of such a variety of races that average heights for different ages vary greatly. Therefore, if we are to have an effective table of proportions for muscular development, we will have to consider the three types along with a height standard, and though chronological age averages may be mentioned, they must not be given very great value.

The measurement tables published in this book, therefore, are arranged according to height and

to the three types mentioned. The writer is well aware that in abandoning the usual chronological age standard, or the age-height standard, there is likely to arise a great deal of adverse criticism, not so much because of any seeming fault in the system herein proposed, but largely because we have all grown up with the idea that children of about the same age should be about the same height, and have about the same girths. And yet, no doubt, many children of a naturally slender physique—a physique typical of their particular families—children who are perfectly strong and healthy in their slenderness, have been worried, or their parents have been worried, because some ignorant physical instructor or examiner, or even physician, has said that they were ten pounds or more under weight, for instance, or too narrow for their height, or far too thin, and so on. And so it is likely, also, that children who were considerably heavier than the “average” for their age and height have been induced to take weight-decreasing exercises, and perhaps even encouraged to concern themselves with special weight-reducing diets.

The value of measuring should be the information it can give concerning proportions and muscular development, and the direct effect upon the child measured; for by this simple process children can be greatly interested in their physical

status, can be given a strong desire for improvement, and can even be brought to such a condition that they will sacrifice almost anything that will tend to harm their physiques or that will prevent the best development.

These tables are planned to enable a physical instructor or examiner, or even a teacher or a parent, to find if a child is well-developed for his *height* and *type*. Also, the whole system is planned so that its application will be likely to give a child a compelling interest in his physique—an interest that will not only cause him to desire to improve it and to perfect it, but that will also cause him to abandon willingly bad habits that will tend to hurt him physically. A study of “boy psychology” indicates that a normal boy is more interested in his physical development than in any other one thing, and that if he has not this characteristic interest, it can be aroused easily by measuring his “muscles,” showing him photographs of boys, or actual boys of his own age, who have acquired first-class muscular developments, by having him hear a talk or two given by some prominent local athlete, and by getting him to compete with other boys for physical improvement or for the possession of the best “all-round” physique.

In Philadelphia, where this system has been carried on experimentally for several years, com-

petitions of this kind were held in four public schools—competitions for the greatest physical improvement during the year, thus giving the best chance to those having the worst physiques, and competitions between schools to find the boy with the best all-round physique. The interest in these contests has been extraordinary from the beginning. Again, when the boys were first measured, they were rated as "First Class," "Second Class," or "Third Class," according to their physical status, and they wore buttons indicating to which "class" they belonged. The third-class boys hated to advertise themselves as being only "third-rate," but they had to wear the buttons so as to be eligible for membership in various recreational and vocational-guidance clubs which were organized for their benefit. So they wore the low-class buttons, but did all in their power to become second-class and even first.

This system has been most effective in causing the boys to strive for physical perfection. The writer is acquainted with one class of forty boys about to graduate from one of the grammar schools, in which this system is being tried out for the third year. At the beginning this class contained but one first-class boy. Now over half the class is first-class, and all but three of the remainder second-class.

The winners of the competitions have their

photographs taken, and these are permanently displayed in their schools. The whole process interests the boys so much that they are always anxious to know what kind of things will improve their physical development, and what things will harm it. But there are no "anti-cigarette" talks, for instance. "Anti" talks of any kind constitute negative teaching, which is excessively bad pedagogy and psychology, and quite without beneficial effect. The "don't" method is an abject failure. The only kind of teaching is a positive teaching. Encourage the children to *do* something that will indirectly prevent or discourage them from doing something that they should not do, and you will find this method as effective as you can desire. So, in the carrying on of this system, such a matter as smoking might be mentioned almost casually, thus:

"Well, cigarettes will not kill you right off, I dare say, and I suppose they will not immediately make you stone blind, or crazy, or give you consumption, or the like. But there is one thing about it: if you *do* smoke—well, the fellows who don't, will get ahead of you in this competition!"

To boys that makes a perfectly logical argument. They characteristically like competitions, and they wish very much to win this kind of competition. Through such a means any bad habit can be effectively attacked, from such simple

matters as coffee-drinking and keeping late hours, to more serious ones.

So, you see, there is more in the physical training of boys than the mere giving of exercises and the taking of measurements. The measurements may or may not be valuable in themselves, but the effect of measuring upon the children can be made a strong and decided influence for good, an influence for clean morality a hundred times more effective than any number of "don't" class-room lessons on the physiology of sex hygiene. It is an "indirect" method for moral development, and all the more effective because indirect.

ATHLETICS AND SPORTS

CHAPTER III

Athletics and Sports

There are few influences more valuable than those of our usual school sports and athletics—when they are managed with care and judgment. They organize the native “play” spirit of the child, and play is of the very greatest import in the moral, mental, and physical development of the girl and the boy. And by play I mean the kind of play characteristic of children in the different stages of their development, and not the kinds of play sometimes forced upon them by ignorant or unthinking adults for the avowed reason that the children will be benefited thereby.

A very good example is dancing. All children like to dance, and many dances have almost spontaneously sprung up among children—individual, primitive dances, such as can be found among the street children in our large cities. I do not mean the ordinary, dancing-school “round” or “contact” dance at all, with its artificial environment and manner, its unvaried movement, and baneful psychic influence. I mean the more free and open dance of the “folk” variety, where the movements are varied and

graceful, and where the pleasure is primarily in the movement and not in sex interest, as is the case in the common dancing-school dances. Dr. G. Stanley Hall tells us that the first kind of dance is immensely valuable, but that dancing has fallen on "evil days," and that the modern dance has for its attraction sex interest only.

Generally, too, where children are sent by the dozen to the semi-fashionable dancing school, we find their parents of the well-to-do type whose children so often "go wrong." We find these children are rarely allowed full play to their many natural instincts. Their parents cannot realize that the boy of twelve is not a man in miniature, but a creature as different from a man as one kind of animal is from another. These parents do not realize that their children have many normal characteristic instincts—both girls and boys—which must be provided with means for a natural expression to prevent a perverted breaking-out later on. Here is the fatal mistake of creating an adult standard of manners for young children—the dangerous endeavor to make the boys and girls little "gentlemen" and little "ladies." They are sent to dancing school to get *poise* and *manners*, and an artificial standard of behavior is forced upon them. The outlets for the expression of their normal semi-barbaric instincts are closed to them, and only one instinct

is permitted opportunity for free and precocious development—that is, the sex instinct. Our dancing schools, where children of the “best” families go, are but institutions for suppressing natural instincts and for the encouraging of the precocious development of instincts which do not need encouragement at all. The moral downfall of many such children has undoubtedly begun in the common children’s dancing class.

But many folk dances are excellent, and children actually enjoy them. And it is an encouraging point that they are gradually being introduced, largely through the influence of the public schools.

It is not the place of this book to describe the many plays and games that are so valuable for children. There are a number of able and comprehensive books on the subject. A few words of criticism and warning, however, are quite in place.

Co-operative sports, requiring the organization of “teams,” are very valuable. Good team-work means the elimination of the individual ego, and a boy learns to sacrifice himself and his desire for getting into the “lime-light” for the sake of his team. This co-operative spirit develops with adolescence, before which time “teams” are but collections of individuals, of which every one wants to be “pitcher,” or “quarter-back,” and so on.

Up to adolescence the most enjoyable kind of games are those in which individuals compete against each other for individual glory, and it is a mistake to endeavor to develop real team-work before the natural time for it. For the same reason, class drills in different physical exercises are not of very great value, simply because the child is not greatly interested in group work, and exercise is very effective only when there is a direct interest in it on the part of the child.

We must be very careful, however, especially when we consider the regular school sports, to see to it that they are suited to each individual child. It is amazing how common it is for school football teams to be formed, the only requirement being that the members be strong, active, and courageous. It never enters the minds of many coaches to inquire as to the physical fitness of each boy for that particular kind of sport.

Football is an especially good example. At best it is not a particularly safe game for boys, though many bad points have been eliminated. The real danger seems to come in the private-school teams. Many schools encourage the formation and training of such teams, not for the individual benefit of the boys, but for the advertising a successful team gives a school. So we find the paid, professional coaches—who are often entirely ignorant of the science of physical development—willing

to "take a chance" and run the risk of sacrificing any boy for the sake of the team, or, rather, for advertising himself and the school. It is common for private academies to put all their resources at work for the development of successful teams, the boys not belonging to the teams getting no physical attention whatever, so far as sports are concerned. The writer knows of one typical academy where every boy is required to pay \$5 each year, for "athletics." This brings \$1250, \$1000 of which goes to a professional coach, who occupies himself with the senior school teams which are supposed to represent the school, and the remainder to incidental expenses connected with the work—the great majority of the boys receiving absolutely *no* attention as far as the encouragement and training in sports is concerned.

Frequently, as has been said, physical trainers or coaches allow boys to join teams, or actually persuade them to do so, who are not fitted for such sport at all. We hear of many serious accidents, especially in football; and a great number are caused by allowing a young boy, who is big and strong for his age, to play on equal terms with older boys, who may be no larger, or who may even be smaller, but who are much more strongly "knit" and thus able to bear physical strains, without harm, which might disable the younger boy for life.

Not only so, but the trainers do not seem to be aware of the fact that a boy who has grown very large and strong for his age, generally has a heart a little small in proportion to his size—a heart which should be given opportunity for normal growth, and which should not be called upon for the great exertion needed in football or in some of the more wearing track sports. Thus it is that many boys are injured, and thus it is that many a boy, who in time might have become a first-class athlete, has found it necessary to go quietly and carefully all the days of his life.

If you are going to have a football team of growing boys, see to it that they are all given a physical examination by an expert, and that they are as nearly as possible of one age and weight. After all, winning the game is not the important thing: the cultivating of team-work is more important, and the encouraging of boys to take interest in out-of-door sports. Generally speaking, regular football had better be left for boys and young men who have attained their growth and who are in first-class physical condition. There are other sports equally valuable. Furthermore, do not make the school team the object of all your interest, but see to it that all the children in the school are interested in outdoor sports suitable for them.

Track sports again need great attention, for it

is another custom to encourage boys to enter for running sports which are unsuitable to their strength and physical condition. Some contests are almost criminal, particularly what is known as the "street marathon" in which are entered boys of all ages and physical conditions. It is almost a heart-rending sight to see the forlorn youngsters staggering home after four or five miles of severe exertion. Long walks and hikes, when gradually led up to, may be fine exercise and beneficial, but the marathon, or any run taking so great an amount of the growing boy's energy, is doubtless responsible for bringing a serious, or, sometimes, even fatal injury. It is the excess that is dangerous, and the permitting of children to take part in strenuous sports for which they are not, at that time, fitted.

Basket-ball is another good example. This is a very fine game, requiring a great deal of energy and skill. If the time of play is carefully limited, the game may be decidedly beneficial, especially if it is seen to that all the players have sound hearts. But the writer has known of so-called "physical directors" who have permitted teams of growing boys to play *all afternoon*, and learned nothing from seeing them go home, white and exhausted, day after day.

Let us, then, have much out-of-door exercise and sport, and let us see to it that all the chil-

dren have it, and not merely picked teams; but let us also be careful to make sure that the children are physically fitted for certain kinds of sport, and that excessive exercise is avoided.

It is not the place of this book to describe school-room conditions that make for bad physical condition and bad physical development. We now know that very small children particularly should not be made to sit for any length of time in the strict order and silence that used to be required of all alike. We know that when children reach the school-desk period, the seats and desks must be regulated to the size of the child. We know that frequent periods for physical relief must be provided, not once a week, as in a certain Pennsylvania high school, but two or three times a day. We are quite aware, these days, that there is no use in giving children physical examinations if they are in badly ventilated class-rooms. Corrective work can be seriously hampered under such conditions.

There is no doubt at all but that school children should be examined two or three times a year, and corrective or remedial measures provided. Such a procedure would mean much for future generations, just as would the finding and segregating of the mentally and morally abnormal.

THE MEASURING

CHAPTER IV

The Measuring

For the measuring you will need a steel tape measure, a height standard, scales, and, of course, printed cards for your records. Remember your main object in taking measurements is not to find valuable averages of measurements—the measurements themselves are a secondary matter. The object is to interest the child in his physical development, first, and other matters should come afterwards. Therefore, every move should be intelligible to the child, and, for the same reason, the measurements should be made in inches and pounds.

I have great doubt if the Anglo-Saxon race will ever give up its inch or its pound. The endeavor to force the common metric system upon the general public is likely to be doomed to failure. But it is quite possible that we can make a rational metric system, so to speak, from our own units, using, for instance, the foot as a unit, divided into tenths and so on, and dividing the pound into tenths likewise. In fact this is already being done to some extent, or sometimes the inch is divided into tenths, though still kept one twelfth

of a foot. There seems to be a good chance, however, of the foot's becoming a unit, with divisions in tenths and hundredths, and so on.

At any rate, to interest children in their measurements they must be made according to a standard well known to them, so that of necessity we must use the inch and pound in this work. If you can get a tape-measure in inches and tenths you will do well.

A hand dynamometer sometimes interests the children a great deal, and it would also be a help to have a spirometer. But as these instruments are not generally at hand, they are not considered in the following tables. The hand-dynamometer is the only strength-testing instrument that should be used. Strength tests have been known to cause painful and even dangerous accidents, and there is not a great deal of value in using them with children.

As a complete stripping cannot always be made, your record cards can be arranged for your own particular needs. When you are measuring, it is well to have three children in the room at a time—one dressing, one undressing, and the other being measured. It affects a boy to be measured before other boys. He wants to "show up" well, and it is likely to make him take an interest more than usual in his physical appearance generally. Also it is good for the two spectators to have

another boy's faults and good points pointed out before them. The examiner should be one having a great deal of experience with children and one who will quickly win their confidence. A person of the right character and personality put in charge of such work may mean a great deal for the future of the children coming into personal contact with him.

When measuring the boy's height, see that he stands naturally under the standard. If you cannot have a regular height standard, then make foot and inch marks on the wall, or paste a cloth tape upon it, and then have the boy stand under a right-angled triangle held against the tape. By this means you can get his height just as accurately. Whether the boy is stripped altogether or not, he should take his shoes off for this measurement; otherwise it is valueless.

The shoulder girth is taken around the shoulders at their greatest measurement. The tape should not be pulled tightly, for the flesh gives considerably under undue pressure. The tension should be just enough to hold the measure in correct position.

The chest. Place the tape around the upper part of the chest so that it will take a level line just under the arm-pits. Have the boy take as big a breath as he can and then exhale all he can. Put down the girth, contracted and expanded,

and then the difference, or chest expansion. The same process is repeated with the measure an inch or an inch and a half below the bottom of the breast-bone. Take the largest measurement you can get. The exact place will vary with individuals. The chest girth and "average" expansion are given in the tables.

The arms. Measure about the middle of the upper arm, letting the arm hang loosely. Then measure the upper arm again with the biceps contracted fully, taking the largest measurement you can get.

The waist. This is taken where the measurement is smallest. You must use care in this to see that the waist is not contracted. Many children will contract the waist a little upon its being measured.

The hips, thighs, and calves are also taken at the point of greatest measurement. Be careful that the boy stands evenly on both feet.

Before comparing his measurements with those of the tables you must decide to what *type* he belongs. You can almost tell with your eye whether he is normally *slender*, *medium*, or *heavy*. Another name for *heavy* would be *thick-set*. This does not mean *fat*. The obviously fat boy is an abnormal type, and these measurements are not suited for boys having a great excess of adipose tissue.

It is found that there is a great variation in the weights of boys of the same height. Between a normally slender boy and a normally thick-set boy of the same height there may be a difference of nearly thirty pounds. According to the usual tables of measurements the slender boy would be marked down as being so many pounds "under weight," and the thick-set boy might even be given weight-reducing exercises. So, as has been said, we have found it reasonable to divide children into three physical types, just as adults can be divided, that is, the *slender type*, the *medium type*, and the *heavy type*.

Between boys of the same height but of different types there are corresponding differences in girths. But a slight increase of girth all over the body would not make a great difference in measurement in any one place, but would make a decided difference in weight. So the simplest method of tabulating *types* is by the height-weight standard. Of course the three types are not absolutely clear and distinct from each other, for there are gradations between them, and it would be possible to tabulate differences to almost any extent between the extremes. We have inserted two intermediate tables, one between the slender and medium, called *slender-medium*, and one between the medium and heavy, called *medium-heavy*. For convenience it is advisable

to recognize the five types, using for the *medium* the "average" measurements of many children (in the following tables five thousand children were used in obtaining some of the figures) and then grouping the *slender* and *heavy* types about the average measurements of children who were obviously more slender than the average, or more thick-set.

To find the type of child being measured, find his height and weight. Find the same height on the *Type Table* and see to which type his weight corresponds most closely. For instance, let us say the height of a boy is 60 inches and his weight 87 pounds. This comes nearest being the weight corresponding to the 60-inch height in the *medium-type* table, so we would class the child as a *medium-type*. Should the weight be half-way between the weights of two of the tables, class the boy with the more slender-type table. That is, if a boy was 51 inches high and weighed $63\frac{1}{2}$ pounds, this would be half-way between the weight of a slender-medium boy of 51 inches and a heavy-type boy of the same height. This boy would be classed with the *medium-heavy type*. Remember, too, that the tables are not meant for the obese boy. For such a boy girths mean little, and all you can notice will be such matters as chest expansion and a few muscular contractions.

When a boy's measurements are compared with those tabulated for his height, weight, and type, slight differences in girths must not be given too much significance, though evidences of muscular development are to be given full importance. But remember that the great purpose of taking these measurements is the interesting of the boy in his own physique, so that he can be told to advantage how much under or over he is the average measurements of his type. Furthermore, it acts as a great stimulus to "standardize" a boy according to his physical status—that is, according to his approach to the perfect measurements for his type. This process is a purely arbitrary one and can have little or no scientific meaning; but the value is great from a psychological standpoint, and this has been found true by several years of experiment with many hundreds of boys. In this standardizing, three classes are recognized. The first-class boy approaches very nearly the averages for his type, weight and height. The second-class boy has a fair development, but not as good as it might be, and the third-class is distinctly inferior to the second. In this standardizing no credit is given to measurements which are very little under a boy's own control. So special credit cannot be given to height, for instance.

The following measurements are used in mak-

ing this purely arbitrary standardization: shoulder girth, chest, hip, thigh, and calf girths, chest expansion, and the "difference" in the girth of the upper arm when the biceps is contracted. Consider 100 as an *ideal* standard. From 93 to 100 inclusive can be considered first-class, from 84 to 92 inclusive second-class, and below 84 third-class. For every quarter-inch variation from the standard in shoulder girth, chest girth, hip girth, thigh girth, and calf girth, add or subtract one from the boy's record. For each one-eighth inch variation from the standard in chest expansion and in the "difference" of each arm, add or subtract one. That is, if a boy's shoulder girth were an inch under the standard, four would be subtracted from his record, and if his chest expansion were a quarter-inch over the standard, two would be added to his record. Some boys having an exceptionally fine physique will go over 100. The writer knows a boy of eleven who attained 130, and another of nine whose standing is 123. These are, of course, exceptional, but they can be used to stimulate their schoolmates or classmates by being pointed out as being especially fine types of boys. The effect upon the boys thus pointed out has been found to be very good; for they attain a high regard for their physical perfection, and are careful to avoid anything they believe will injure

this perfection in any way or prevent its regular development and growth.

Finally, it should be said that the weights given are those of boys fully stripped. If a boy is stripped to the waist only, and has his shoes removed, three pounds subtracted from his weight will fairly account for the clothes he is wearing if his weight is above 80, $3\frac{1}{2}$ pounds if above 100, and $2\frac{3}{4}$ pounds if below 80. This is arbitrary, but cannot be avoided.

In the measurement tables that follow "ages" are included in parentheses. They cannot be given any great value, but it interests people, sometimes, to know how the measurements of a child compare with those of the "average" child of the same age. Unfortunately the writer has not a sufficient number of measurements to enable him to compile a reliable table for girls.

In public schools there is usually very little medical or physical examination. The introduction of such a system as described may have to come gradually, especially in conservative communities where anything "new" is looked upon suspiciously because of its mere newness. Stripping to the waist is possibly all that can be done at first by way of examination, in which case the hip, thigh, and calf measurements must be omitted, the boys' "scores" being made up without them.

It must be remembered, too, that the measurements given in the tables are not "average" measurements of all the boys in large indiscriminate groups. They are average measurements of well-built and healthy boys only; they are therefore above the general average, so that when a boy comes up to the measurements given in this book, he can feel that his development is very good, and quite better than that of the "average" boy of his type.

When a boy is obviously below the development of his type and height, then he can be given such of the following exercises as will be most likely to aid in making up the deficiency, so that a boy standardized as third-class, for instance, can be helped to become second-class, and first-class with a rapidity largely according to his own interest and desire.

It has been found well not to allow a boy to be standardized over second-class if he has a bad posture that he can remedy. That is, a boy may have a score of over one hundred, and yet will score but second-class if he has stooped shoulders, for instance.

When you have found the height and weight, find in which table you have the weight approaching most nearly that of the boy being measured. Then refer to the table of the particular type.

The measurements here given have been taken

TYPE TABLES

Height	<i>Slender</i> Weight	<i>Slender- Medium</i> Weight	<i>Medium</i> Weight	<i>Medium- Heavy</i> Weight	<i>Heavy</i> Weight
51	54	56.5	59	62	65
52	56	59	62.5	65.75	69
53	58	61	64	68.5	73.5
54	59.5	63	68	73.5	79
55	62	68	72	77.5	83.25
56	65	70	75	82	89.5
57	67	72.5	78	86	94.5
58	69	76	83	91	99
59	73	80	87	94	103
60	77	83.5	90	98.5	107.5
61	82.5	88.75	95	103.5	112
62	87.5	93.75	100	109.5	119
63	93	99.5	106	115	124
64	100	108	116	122	129
65	110	115	120	128.5	137
66	115	121	127	136.5	146
67	120	127	134	144.5	155
68	124.5	135	145	157.5	170

of children from nine to sixteen years inclusive, as this concerns the very great majority of children of the age that would be influenced by such measuring and also nearly all the children below the high school. This system is particularly adapted to children of the rapid-growing age, that is, up to and including sixteen,

TABLE OF MEASUREMENTS FOR SLENDER TYPE

Height	Weight	Shoulder Girth	Chest Girth	Chest Expansion	Right Arm	"Difference"	Left Arm	"Difference"	Waist	Hips	Right and Left Thighs	Right and Left Calves	(Average Age)
51	54	28 $\frac{1}{2}$	22 $\frac{1}{4}$	2 $\frac{3}{4}$	6	$\frac{3}{4}$	6	$\frac{3}{4}$	19 $\frac{1}{2}$	23 $\frac{1}{4}$	14	9 $\frac{1}{2}$	
52	56	28 $\frac{3}{4}$	22 $\frac{1}{2}$	2 $\frac{3}{4}$	6 $\frac{1}{4}$	$\frac{3}{4}$	6 $\frac{1}{4}$	$\frac{3}{4}$	19 $\frac{3}{4}$	23 $\frac{3}{4}$	14 $\frac{1}{2}$	9 $\frac{3}{4}$	(9)
53	58	29 $\frac{3}{8}$	23	2 $\frac{3}{4}$	6 $\frac{1}{2}$	1	6 $\frac{1}{2}$	1	20	24	15	10	
54	59 $\frac{1}{2}$	29 $\frac{7}{8}$	23 $\frac{1}{4}$	2 $\frac{7}{8}$	6 $\frac{5}{8}$	1 $\frac{1}{8}$	6 $\frac{5}{8}$	1 $\frac{1}{8}$	20	24 $\frac{1}{2}$	15 $\frac{1}{8}$	10 $\frac{1}{4}$	(10)
55	62	30 $\frac{1}{2}$	24 $\frac{1}{8}$	3	6 $\frac{3}{4}$	1 $\frac{1}{8}$	6 $\frac{3}{4}$	1 $\frac{1}{8}$	20 $\frac{1}{2}$	25 $\frac{1}{4}$	15 $\frac{3}{8}$	10 $\frac{1}{2}$	
56	65	31 $\frac{1}{2}$	24 $\frac{1}{2}$	3 $\frac{1}{8}$	7	1 $\frac{1}{4}$	7	1 $\frac{1}{8}$	21	26	15 $\frac{1}{2}$	10 $\frac{3}{4}$	(11)
57	67	31 $\frac{7}{8}$	25 $\frac{1}{8}$	3 $\frac{1}{4}$	7 $\frac{1}{4}$	1 $\frac{1}{4}$	7 $\frac{1}{4}$	1 $\frac{1}{8}$	22	26 $\frac{1}{2}$	15 $\frac{7}{8}$	10 $\frac{3}{4}$	
58	69	32 $\frac{1}{8}$	25 $\frac{7}{8}$	3 $\frac{3}{8}$	7 $\frac{3}{8}$	1 $\frac{3}{8}$	7 $\frac{1}{4}$	1 $\frac{1}{4}$	22 $\frac{7}{8}$	27	16 $\frac{3}{8}$	10 $\frac{7}{8}$	(12)
59	73	32 $\frac{5}{8}$	26 $\frac{1}{8}$	3 $\frac{3}{8}$	7 $\frac{5}{8}$	1 $\frac{3}{8}$	7 $\frac{3}{8}$	1 $\frac{1}{4}$	23	27 $\frac{5}{8}$	16 $\frac{3}{4}$	10 $\frac{7}{8}$	
60	77	33	26 $\frac{1}{2}$	3 $\frac{5}{8}$	7 $\frac{3}{4}$	1 $\frac{1}{2}$	7 $\frac{1}{2}$	1 $\frac{1}{4}$	23 $\frac{1}{4}$	28 $\frac{1}{4}$	17 $\frac{1}{4}$	11	(13)
61	82 $\frac{1}{2}$	33 $\frac{5}{8}$	26 $\frac{5}{8}$	3 $\frac{3}{4}$	7 $\frac{3}{4}$	1 $\frac{1}{2}$	7 $\frac{5}{8}$	1 $\frac{1}{4}$	24	28 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{1}{8}$	
62	87 $\frac{1}{2}$	34 $\frac{1}{4}$	26 $\frac{3}{4}$	3 $\frac{7}{8}$	7 $\frac{7}{8}$	1 $\frac{1}{2}$	7 $\frac{5}{8}$	1 $\frac{3}{8}$	24 $\frac{3}{4}$	28 $\frac{7}{8}$	17 $\frac{7}{8}$	11 $\frac{1}{4}$	
63	93	35	27	4	8	1 $\frac{5}{8}$	7 $\frac{3}{4}$	1 $\frac{3}{8}$	25 $\frac{1}{2}$	29 $\frac{1}{4}$	18 $\frac{1}{4}$	11 $\frac{1}{2}$	(14)
64	100	35 $\frac{5}{8}$	27 $\frac{1}{8}$	4	8 $\frac{1}{8}$	1 $\frac{3}{4}$	7 $\frac{3}{4}$	1 $\frac{3}{8}$	25 $\frac{3}{4}$	29 $\frac{3}{4}$	18 $\frac{3}{4}$	11 $\frac{3}{4}$	
65	110	36 $\frac{1}{4}$	27 $\frac{3}{4}$	4 $\frac{1}{8}$	8 $\frac{1}{4}$	1 $\frac{3}{4}$	7 $\frac{7}{8}$	1 $\frac{1}{2}$	26 $\frac{1}{8}$	30 $\frac{1}{4}$	19 $\frac{1}{4}$	12	
66	115	37	28 $\frac{1}{2}$	4 $\frac{1}{8}$	8 $\frac{1}{2}$	1 $\frac{7}{8}$	8 $\frac{1}{8}$	1 $\frac{5}{8}$	26 $\frac{1}{2}$	30 $\frac{3}{4}$	19 $\frac{3}{4}$	12 $\frac{1}{2}$	(15)
67	120	38	28 $\frac{1}{2}$	4 $\frac{1}{4}$	9	2	8 $\frac{1}{2}$	1 $\frac{3}{4}$	27	31 $\frac{1}{2}$	19 $\frac{7}{8}$	13	
68	124 $\frac{1}{2}$	38 $\frac{7}{8}$	29 $\frac{1}{2}$	4 $\frac{1}{4}$	9	2	8 $\frac{1}{2}$	1 $\frac{3}{4}$	28	32 $\frac{1}{2}$	19 $\frac{7}{8}$	13	(16)

TABLE OF MEASUREMENTS FOR SLENDER-MEDIUM TYPE

Height	Weight	Shoulder Girth	Chest Girth	Chest Expansion	Right Arm	"Difference"	Left Arm	"Difference"	Waist	Hips	Right and Left Thighs	Right and Left Calves	(Average Age)
51	56 $\frac{1}{2}$	29 $\frac{1}{2}$	23	2 $\frac{3}{4}$	6 $\frac{3}{8}$	$\frac{3}{4}$	6 $\frac{1}{4}$	$\frac{3}{4}$	20	23 $\frac{3}{4}$	14 $\frac{7}{8}$	10 $\frac{1}{8}$	
52	59	29 $\frac{3}{4}$	23 $\frac{1}{4}$	2 $\frac{7}{8}$	6 $\frac{5}{8}$	$\frac{7}{8}$	6 $\frac{5}{8}$	$\frac{7}{8}$	20 $\frac{3}{8}$	24 $\frac{3}{8}$	15 $\frac{1}{4}$	10 $\frac{3}{8}$	(9)
53	61	30 $\frac{1}{4}$	23 $\frac{5}{8}$	2 $\frac{7}{8}$	6 $\frac{3}{4}$	1	6 $\frac{3}{4}$	1	20 $\frac{7}{8}$	24 $\frac{3}{4}$	15 $\frac{5}{8}$	10 $\frac{1}{2}$	
54	63	30 $\frac{3}{4}$	24	2 $\frac{7}{8}$	7	1 $\frac{1}{8}$	6 $\frac{7}{8}$	1 $\frac{1}{8}$	21	25 $\frac{3}{8}$	15 $\frac{3}{4}$	10 $\frac{3}{4}$	(10)
55	68	31 $\frac{7}{8}$	24 $\frac{5}{8}$	3	7 $\frac{1}{8}$	1 $\frac{1}{8}$	7	1 $\frac{1}{8}$	21 $\frac{5}{8}$	25 $\frac{3}{4}$	16 $\frac{1}{8}$	10 $\frac{7}{8}$	
56	70	32 $\frac{7}{8}$	25 $\frac{1}{8}$	3 $\frac{1}{8}$	7 $\frac{3}{8}$	1 $\frac{1}{4}$	7 $\frac{1}{4}$	1 $\frac{1}{8}$	22 $\frac{1}{8}$	27 $\frac{1}{8}$	16 $\frac{3}{8}$	11	(11)
57	72 $\frac{1}{2}$	33 $\frac{3}{8}$	26	3 $\frac{1}{4}$	7 $\frac{1}{2}$	1 $\frac{1}{4}$	7 $\frac{3}{8}$	1 $\frac{1}{8}$	22 $\frac{7}{8}$	27 $\frac{1}{2}$	16 $\frac{3}{4}$	11 $\frac{1}{8}$	
58	76	33 $\frac{3}{4}$	26 $\frac{7}{8}$	3 $\frac{5}{8}$	7 $\frac{5}{8}$	1 $\frac{3}{8}$	7 $\frac{3}{4}$	1 $\frac{1}{4}$	23 $\frac{1}{2}$	28	17 $\frac{1}{4}$	11 $\frac{1}{4}$	(12)
59	80	34	27	3 $\frac{3}{8}$	7 $\frac{7}{8}$	1 $\frac{3}{8}$	7 $\frac{5}{8}$	1 $\frac{1}{4}$	24	28 $\frac{1}{2}$	17 $\frac{1}{2}$	11 $\frac{3}{8}$	
60	83 $\frac{1}{2}$	34 $\frac{1}{2}$	27 $\frac{1}{4}$	3 $\frac{5}{8}$	8	1 $\frac{1}{2}$	7 $\frac{3}{4}$	1 $\frac{1}{4}$	24 $\frac{1}{2}$	29 $\frac{1}{8}$	17 $\frac{7}{8}$	11 $\frac{1}{2}$	(13)
61	88 $\frac{3}{4}$	34 $\frac{7}{8}$	27 $\frac{3}{8}$	3 $\frac{3}{4}$	8 $\frac{1}{8}$	1 $\frac{1}{2}$	7 $\frac{7}{8}$	1 $\frac{1}{4}$	25 $\frac{1}{8}$	29 $\frac{1}{4}$	18 $\frac{1}{4}$	11 $\frac{5}{8}$	
62	93 $\frac{3}{4}$	35 $\frac{5}{8}$	27 $\frac{1}{2}$	3 $\frac{7}{8}$	8 $\frac{1}{4}$	1 $\frac{1}{2}$	8	1 $\frac{3}{8}$	25 $\frac{3}{4}$	30 $\frac{1}{2}$	18 $\frac{5}{8}$	11 $\frac{3}{4}$	
63	99 $\frac{1}{2}$	36	27 $\frac{3}{4}$	4	8 $\frac{3}{8}$	1 $\frac{5}{8}$	8 $\frac{1}{8}$	1 $\frac{3}{8}$	26 $\frac{3}{8}$	31	19	12	(14)
64	108	36 $\frac{5}{8}$	28 $\frac{1}{8}$	4	8 $\frac{1}{2}$	1 $\frac{7}{8}$	8 $\frac{1}{4}$	1 $\frac{1}{2}$	26 $\frac{3}{4}$	31 $\frac{1}{2}$	19 $\frac{3}{8}$	12 $\frac{1}{8}$	
65	115	36 $\frac{7}{8}$	28 $\frac{3}{8}$	4 $\frac{1}{8}$	8 $\frac{3}{4}$	1 $\frac{7}{8}$	8 $\frac{3}{8}$	1 $\frac{1}{2}$	27	31 $\frac{7}{8}$	19 $\frac{7}{8}$	12 $\frac{1}{2}$	
66	121	37 $\frac{5}{8}$	29	4 $\frac{1}{8}$	8 $\frac{7}{8}$	2	8 $\frac{1}{2}$	1 $\frac{5}{8}$	27 $\frac{1}{4}$	32 $\frac{1}{4}$	20 $\frac{1}{8}$	12 $\frac{1}{2}$	(15)
67	127	38 $\frac{1}{2}$	29 $\frac{1}{2}$	4 $\frac{1}{4}$	9 $\frac{1}{4}$	2	8 $\frac{3}{4}$	1 $\frac{3}{4}$	28	32 $\frac{3}{4}$	20 $\frac{1}{8}$	13 $\frac{1}{4}$	
68	135	39 $\frac{3}{8}$	30 $\frac{1}{2}$	4 $\frac{1}{4}$	9 $\frac{1}{4}$	2 $\frac{1}{8}$	8 $\frac{3}{4}$	1 $\frac{7}{8}$	28 $\frac{5}{8}$	33 $\frac{1}{2}$	20 $\frac{1}{4}$	13 $\frac{1}{4}$	(16)

TABLE OF MEASUREMENTS FOR MEDIUM TYPE

Height	Weight	Shoulder Girth	Chest Girth	Chest Expansion	Right Arm	"Difference"	Left Arm	"Difference"	Waist	Hips	Right and Left Thighs	Right and Left Calves	(Average Age)
51	59	30 $\frac{1}{2}$	23 $\frac{3}{4}$	2 $\frac{3}{4}$	6 $\frac{3}{4}$	$\frac{3}{4}$	6 $\frac{1}{2}$	$\frac{3}{4}$	20 $\frac{1}{2}$	24 $\frac{1}{4}$	15 $\frac{3}{4}$	10 $\frac{7}{8}$	
52	62.5	30 $\frac{3}{4}$	24	3	7	1	7	1	21	25	16	11	(9)
53	64	31	24 $\frac{1}{4}$	3	7 $\frac{1}{8}$	1	7 $\frac{1}{8}$	1	21 $\frac{3}{4}$	25 $\frac{5}{8}$	16 $\frac{3}{8}$	11 $\frac{1}{8}$	
54	68	31 $\frac{3}{4}$	24 $\frac{3}{4}$	3	7 $\frac{3}{8}$	1 $\frac{1}{8}$	7 $\frac{1}{4}$	1 $\frac{1}{8}$	22 $\frac{1}{8}$	26 $\frac{1}{4}$	16 $\frac{3}{4}$	11 $\frac{1}{4}$	(10)
55	72	33 $\frac{1}{4}$	25 $\frac{1}{8}$	3 $\frac{1}{8}$	7 $\frac{5}{8}$	1 $\frac{1}{8}$	7 $\frac{3}{8}$	1 $\frac{1}{8}$	22 $\frac{7}{8}$	26 $\frac{7}{8}$	17	11 $\frac{3}{8}$	(11)
56	75	34 $\frac{1}{4}$	25 $\frac{3}{4}$	3 $\frac{1}{4}$	7 $\frac{3}{4}$	1 $\frac{1}{4}$	7 $\frac{5}{8}$	1 $\frac{1}{4}$	23 $\frac{3}{8}$	27 $\frac{5}{8}$	17 $\frac{1}{4}$	11 $\frac{1}{2}$	
57	78 $\frac{1}{2}$	34 $\frac{3}{8}$	26 $\frac{7}{8}$	3 $\frac{3}{8}$	7 $\frac{7}{8}$	1 $\frac{1}{4}$	7 $\frac{5}{8}$	1 $\frac{1}{4}$	23 $\frac{3}{4}$	28 $\frac{1}{2}$	17 $\frac{5}{8}$	11 $\frac{5}{8}$	(12)
58	83	35 $\frac{3}{8}$	27 $\frac{3}{8}$	3 $\frac{1}{2}$	8	1 $\frac{1}{2}$	7 $\frac{3}{4}$	1 $\frac{1}{4}$	24 $\frac{1}{8}$	29 $\frac{1}{8}$	18 $\frac{1}{8}$	11 $\frac{3}{4}$	
59	87	35 $\frac{1}{2}$	27 $\frac{5}{8}$	3 $\frac{1}{2}$	8 $\frac{1}{8}$	1 $\frac{3}{8}$	7 $\frac{7}{8}$	1 $\frac{1}{4}$	25 $\frac{1}{8}$	29 $\frac{3}{4}$	18 $\frac{1}{4}$	11 $\frac{7}{8}$	(13)
60	90	35 $\frac{7}{8}$	28 $\frac{1}{8}$	3 $\frac{3}{4}$	8 $\frac{1}{4}$	1 $\frac{1}{2}$	8	1 $\frac{3}{8}$	25 $\frac{3}{4}$	30 $\frac{5}{8}$	18 $\frac{5}{8}$	12	
61	95	36 $\frac{1}{8}$	28 $\frac{1}{4}$	3 $\frac{7}{8}$	8 $\frac{3}{8}$	1 $\frac{1}{2}$	8 $\frac{1}{8}$	1 $\frac{3}{8}$	26 $\frac{1}{4}$	31 $\frac{3}{8}$	19	12 $\frac{1}{8}$	
62	100	36 $\frac{3}{8}$	28 $\frac{3}{8}$	3 $\frac{7}{8}$	8 $\frac{1}{2}$	1 $\frac{5}{8}$	8 $\frac{1}{4}$	1 $\frac{3}{8}$	26 $\frac{3}{4}$	32 $\frac{1}{8}$	19 $\frac{1}{2}$	12 $\frac{1}{4}$	
63	106	36 $\frac{7}{8}$	28 $\frac{5}{8}$	4	8 $\frac{3}{4}$	1 $\frac{3}{4}$	8 $\frac{3}{8}$	1 $\frac{5}{8}$	27 $\frac{1}{4}$	32 $\frac{3}{4}$	19 $\frac{7}{8}$	12 $\frac{1}{2}$	(14)
64	116	37 $\frac{5}{8}$	29 $\frac{1}{4}$	4 $\frac{1}{8}$	9	2	8 $\frac{1}{2}$	1 $\frac{3}{4}$	27 $\frac{3}{4}$	33 $\frac{1}{4}$	20 $\frac{1}{8}$	12 $\frac{1}{2}$	
65	120	37 $\frac{7}{8}$	29 $\frac{5}{8}$	4 $\frac{1}{8}$	9 $\frac{1}{4}$	2	8 $\frac{3}{4}$	1 $\frac{3}{4}$	27 $\frac{7}{8}$	33 $\frac{1}{2}$	20 $\frac{1}{2}$	13	(15)
66	127	38 $\frac{1}{4}$	30 $\frac{1}{8}$	4 $\frac{1}{4}$	9 $\frac{3}{8}$	2 $\frac{1}{8}$	9	1 $\frac{7}{8}$	28	33 $\frac{3}{4}$	20 $\frac{5}{8}$	13 $\frac{1}{8}$	
67	134	39	30 $\frac{5}{8}$	4 $\frac{1}{4}$	9 $\frac{5}{8}$	2 $\frac{1}{8}$	9 $\frac{1}{8}$	1 $\frac{7}{8}$	28 $\frac{7}{8}$	34	21	13 $\frac{1}{2}$	(16)
68	145	40	31 $\frac{1}{2}$	4 $\frac{3}{8}$	9 $\frac{5}{8}$	2 $\frac{1}{4}$	9 $\frac{1}{8}$	2	29 $\frac{1}{4}$	34 $\frac{1}{2}$	21	13 $\frac{1}{2}$	

TABLE OF MEASUREMENTS FOR MEDIUM-HEAVY TYPE

Height	Weight	Shoulder Girth	Chest Girth	Chest Expansion	Right Arm	"Difference"	Left Arm	"Difference"	Waist	Hips	Right and Left Thighs	Right and Left Calves	(Average Age)
51	62	$31\frac{1}{4}$	$24\frac{3}{8}$	$2\frac{7}{8}$	$7\frac{1}{8}$	$\frac{7}{8}$	$6\frac{7}{8}$	$\frac{7}{8}$	$21\frac{1}{2}$	$25\frac{1}{8}$	$16\frac{1}{8}$	11	(9)
52	$65\frac{3}{4}$	$31\frac{5}{8}$	$24\frac{3}{4}$	3	$7\frac{1}{4}$	1	$7\frac{1}{8}$	1	22	$25\frac{3}{4}$	$16\frac{3}{8}$	$11\frac{3}{8}$	(10)
53	$68\frac{1}{2}$	32	$25\frac{1}{8}$	3	$7\frac{3}{8}$	1	$7\frac{1}{4}$	1	$22\frac{3}{4}$	$26\frac{3}{8}$	$16\frac{3}{4}$	$11\frac{5}{8}$	
54	$73\frac{1}{2}$	$32\frac{1}{2}$	$25\frac{1}{2}$	3	$7\frac{5}{8}$	$1\frac{1}{8}$	$7\frac{3}{8}$	$1\frac{1}{8}$	$23\frac{3}{8}$	27	17	$11\frac{3}{4}$	(11)
55	$77\frac{1}{2}$	$33\frac{3}{8}$	$25\frac{7}{8}$	$3\frac{1}{8}$	$7\frac{3}{4}$	$1\frac{1}{8}$	$7\frac{1}{2}$	$1\frac{1}{8}$	$24\frac{1}{2}$	$27\frac{5}{8}$	$17\frac{1}{4}$	12	
56	82	$34\frac{5}{8}$	$26\frac{5}{8}$	$3\frac{1}{4}$	$7\frac{7}{8}$	$1\frac{1}{4}$	$7\frac{3}{4}$	$1\frac{1}{8}$	$24\frac{7}{8}$	$28\frac{1}{2}$	$17\frac{5}{8}$	$12\frac{1}{8}$	(12)
57	86	$35\frac{1}{8}$	$27\frac{3}{8}$	$3\frac{3}{8}$	8	$1\frac{1}{4}$	$7\frac{7}{8}$	$1\frac{1}{4}$	$25\frac{3}{8}$	$29\frac{3}{8}$	$18\frac{1}{8}$	$12\frac{1}{4}$	
58	91	$35\frac{7}{8}$	28	$3\frac{3}{8}$	$8\frac{1}{8}$	$1\frac{3}{8}$	8	$1\frac{1}{4}$	$25\frac{5}{8}$	$30\frac{5}{8}$	$18\frac{3}{4}$	$12\frac{3}{8}$	(13)
59	94	$36\frac{1}{8}$	$28\frac{3}{8}$	$3\frac{5}{8}$	$8\frac{1}{2}$	$1\frac{1}{2}$	$8\frac{1}{8}$	$1\frac{1}{4}$	$26\frac{1}{4}$	$31\frac{3}{8}$	$18\frac{7}{8}$	$12\frac{1}{2}$	
60	$98\frac{1}{2}$	$36\frac{5}{8}$	$28\frac{7}{8}$	$3\frac{7}{8}$	$8\frac{1}{2}$	$1\frac{5}{8}$	$8\frac{1}{4}$	$1\frac{3}{8}$	$26\frac{3}{4}$	32	$19\frac{1}{4}$	$12\frac{1}{2}$	(14)
61	$103\frac{1}{2}$	$37\frac{3}{8}$	$29\frac{1}{4}$	4	$8\frac{5}{8}$	$1\frac{3}{4}$	$8\frac{3}{8}$	$1\frac{1}{2}$	$27\frac{1}{4}$	$32\frac{5}{8}$	$19\frac{1}{2}$	$12\frac{5}{8}$	
62	$109\frac{1}{2}$	$37\frac{5}{8}$	$29\frac{3}{4}$	4	$8\frac{3}{4}$	$1\frac{3}{4}$	$8\frac{3}{8}$	$1\frac{1}{2}$	$27\frac{3}{8}$	$33\frac{1}{8}$	20	$12\frac{3}{4}$	
63	115	$38\frac{1}{2}$	$30\frac{1}{8}$	$4\frac{1}{8}$	9	2	$8\frac{5}{8}$	$1\frac{3}{4}$	28	$33\frac{5}{8}$	$20\frac{3}{8}$	$12\frac{7}{8}$	(15)
64	122	$39\frac{1}{8}$	$30\frac{3}{4}$	$4\frac{1}{8}$	$9\frac{1}{8}$	$2\frac{1}{8}$	$8\frac{3}{4}$	$1\frac{7}{8}$	$28\frac{7}{8}$	$33\frac{3}{4}$	$20\frac{5}{8}$	13	
65	$128\frac{1}{2}$	$39\frac{1}{2}$	$31\frac{1}{8}$	$4\frac{1}{8}$	$9\frac{1}{4}$	$2\frac{1}{8}$	$8\frac{7}{8}$	$1\frac{7}{8}$	$29\frac{3}{8}$	$33\frac{3}{4}$	$20\frac{3}{4}$	$13\frac{1}{4}$	(16)
66	$136\frac{1}{2}$	$39\frac{5}{8}$	$31\frac{1}{2}$	$4\frac{1}{4}$	$9\frac{1}{2}$	$2\frac{1}{8}$	9	$1\frac{7}{8}$	$29\frac{5}{8}$	$34\frac{1}{4}$	$20\frac{7}{8}$	$13\frac{3}{8}$	
67	$144\frac{1}{2}$	$40\frac{3}{4}$	32	$4\frac{3}{8}$	$9\frac{7}{8}$	$2\frac{1}{8}$	$9\frac{1}{8}$	$1\frac{7}{8}$	$30\frac{1}{8}$	$34\frac{7}{8}$	$21\frac{1}{4}$	$13\frac{5}{8}$	(17)
68	$157\frac{1}{2}$	$41\frac{3}{8}$	$32\frac{3}{4}$	$4\frac{3}{8}$	10	$2\frac{1}{4}$	$9\frac{1}{2}$	2	$31\frac{3}{8}$	$35\frac{3}{8}$	$21\frac{1}{2}$	$13\frac{5}{8}$	

TABLE OF MEASUREMENTS FOR HEAVY TYPE

Height	Weight	Shoulder Girth	Chest Girth	Chest Expansion	Right Arm	"Difference"	Left Arm	"Difference"	Waist	Hips	Right and Left Thighs	Right and Left Calves	(Average Age)
51	65	32	25	3	7 $\frac{1}{2}$	1	7 $\frac{1}{4}$	1	22 $\frac{1}{2}$	26	16 $\frac{1}{2}$	11 $\frac{1}{4}$	(9)
52	69	32 $\frac{5}{8}$	25 $\frac{5}{8}$	3	7 $\frac{1}{2}$	1	7 $\frac{3}{8}$	1	23 $\frac{1}{8}$	26 $\frac{5}{8}$	16 $\frac{3}{4}$	11 $\frac{3}{4}$	(10)
53	73 $\frac{5}{8}$	33	26 $\frac{1}{8}$	3 $\frac{1}{8}$	7 $\frac{5}{8}$	1 $\frac{1}{8}$	7 $\frac{1}{2}$	1 $\frac{1}{8}$	23 $\frac{3}{4}$	27 $\frac{1}{4}$	17 $\frac{1}{8}$	12 $\frac{1}{8}$	
54	79	33 $\frac{1}{8}$	26 $\frac{1}{4}$	3 $\frac{1}{8}$	7 $\frac{7}{8}$	1 $\frac{1}{8}$	7 $\frac{5}{8}$	1 $\frac{1}{8}$	24 $\frac{1}{4}$	27 $\frac{3}{4}$	17 $\frac{3}{8}$	12 $\frac{3}{8}$	(11)
55	83 $\frac{3}{8}$	33 $\frac{5}{8}$	26 $\frac{3}{2}$	3 $\frac{1}{4}$	8	1 $\frac{1}{4}$	7 $\frac{3}{4}$	1 $\frac{1}{8}$	25 $\frac{1}{2}$	28 $\frac{1}{2}$	17 $\frac{5}{8}$	12 $\frac{5}{8}$	
56	89 $\frac{5}{8}$	35	27 $\frac{1}{2}$	3 $\frac{3}{8}$	8 $\frac{1}{8}$	1 $\frac{1}{4}$	8	1 $\frac{1}{8}$	26 $\frac{1}{2}$	29 $\frac{1}{2}$	18 $\frac{1}{8}$	12 $\frac{3}{4}$	(12)
57	94 $\frac{5}{8}$	36	28 $\frac{1}{8}$	3 $\frac{1}{2}$	8 $\frac{1}{4}$	1 $\frac{3}{8}$	8 $\frac{1}{8}$	1 $\frac{1}{4}$	27	30 $\frac{3}{8}$	18 $\frac{5}{8}$	13	
58	99	36 $\frac{3}{8}$	28 $\frac{5}{8}$	3 $\frac{1}{2}$	8 $\frac{3}{8}$	1 $\frac{1}{2}$	8 $\frac{1}{4}$	1 $\frac{1}{4}$	27 $\frac{1}{4}$	32 $\frac{1}{8}$	19 $\frac{1}{2}$	13	(13)
59	103	36 $\frac{3}{4}$	29 $\frac{1}{8}$	3 $\frac{3}{4}$	8 $\frac{1}{2}$	1 $\frac{5}{8}$	8 $\frac{3}{8}$	1 $\frac{3}{8}$	27 $\frac{1}{2}$	33	19 $\frac{5}{8}$	13 $\frac{1}{8}$	
60	107 $\frac{5}{8}$	37 $\frac{1}{2}$	29 $\frac{5}{8}$	4	8 $\frac{7}{8}$	1 $\frac{7}{8}$	8 $\frac{5}{8}$	1 $\frac{1}{2}$	27 $\frac{7}{8}$	33 $\frac{3}{4}$	19 $\frac{7}{8}$	13 $\frac{1}{8}$	(14)
61	112	38 $\frac{3}{8}$	30 $\frac{3}{8}$	4 $\frac{1}{8}$	9	2	8 $\frac{3}{4}$	1 $\frac{5}{8}$	28 $\frac{1}{4}$	34	20 $\frac{1}{8}$	13 $\frac{1}{4}$	
62	119	39 $\frac{3}{8}$	31 $\frac{1}{8}$	4 $\frac{1}{8}$	9 $\frac{1}{8}$	2	8 $\frac{3}{4}$	1 $\frac{5}{8}$	28 $\frac{3}{8}$	34 $\frac{1}{8}$	20 $\frac{1}{2}$	13 $\frac{1}{4}$	
63	124	40 $\frac{1}{8}$	31 $\frac{3}{4}$	4 $\frac{1}{4}$	9 $\frac{1}{4}$	2 $\frac{1}{8}$	9	1 $\frac{7}{8}$	28 $\frac{3}{4}$	34 $\frac{1}{8}$	20 $\frac{7}{8}$	13 $\frac{3}{8}$	(15)
64	129	40 $\frac{1}{2}$	32 $\frac{1}{4}$	4 $\frac{1}{4}$	9 $\frac{1}{4}$	2 $\frac{1}{4}$	9	2	30	34 $\frac{1}{4}$	21 $\frac{1}{8}$	13 $\frac{1}{2}$	
65	137	41	32 $\frac{3}{4}$	4 $\frac{1}{4}$	9 $\frac{3}{8}$	2 $\frac{1}{4}$	9 $\frac{1}{8}$	2	30 $\frac{7}{8}$	34 $\frac{1}{2}$	21 $\frac{1}{8}$	13 $\frac{1}{2}$	(16)
66	146	41 $\frac{1}{2}$	33	4 $\frac{3}{8}$	9 $\frac{3}{4}$	2 $\frac{1}{4}$	9 $\frac{1}{8}$	2	31 $\frac{1}{4}$	34 $\frac{7}{8}$	21 $\frac{1}{4}$	13 $\frac{5}{8}$	
67	155	42 $\frac{1}{2}$	33 $\frac{1}{2}$	4 $\frac{1}{2}$	10 $\frac{1}{8}$	2 $\frac{1}{4}$	9 $\frac{1}{2}$	2	32 $\frac{1}{4}$	35 $\frac{7}{8}$	21 $\frac{1}{2}$	13 $\frac{3}{4}$	(17)
68	170	42 $\frac{3}{4}$	34	4 $\frac{1}{2}$	10 $\frac{1}{2}$	2 $\frac{3}{8}$	10	2 $\frac{1}{8}$	33 $\frac{1}{2}$	36 $\frac{1}{4}$	22 $\frac{1}{8}$	13 $\frac{7}{8}$	

SPECIAL EXERCISES

CHAPTER V

Special Exercises

When a boy or a girl has had any particular developmental deficiency pointed out, if it is one that can be remedied or improved by exercises, the following movements may be used. Many of these are especially applicable to individual use. In large schools it is impossible to give each child each day special exercises. But if a boy or a girl has been properly interested in physical development—this being a main object of this work—then he or she will be willing and anxious to work for improvement in out-of-school hours. So in the school general movements can be given, care being taken, however, to see that no child is taking a kind of exercise for which he or she is not fitted. The great fault with the usual class drill is that there are present, now and then, children who may be harmed by some of the more rapid and strenuous movements. For this reason every child should have at least a heart examination.

When a boy is “measured” and his interest thereby aroused, he can be shown his deficiency, if he has one, and also be shown the appropriate

exercise for it. He can be told that the proper time for this work is when he gets up in the morning, that it should be done in fresh clean air, and that the great majority are to be continued until he begins to feel tired. It is hard to say just how many repetitions of a movement a boy should make at one time, or just how long he should exercise. If he continues, however, until he begins to feel a little tired, you can feel reasonably sure that he is not working beyond his strength.

When a boy has a remediable deficiency he can be told about how long it may take him to make it up. A subnormal chest expansion can be brought up very rapidly—the first inch, for instance, in a month or two. Improvement of the greater muscles takes longer. But a boy takes special interest in correcting his defects if he can come back, at stated intervals, and see how much he has improved, and perhaps be advanced through the three classes into which boys can be divided according to their physical status. The school competitions help a great deal, as has been said, one being for the greatest improvement during the year, giving the best chance to the worst developed boy, and one for the best developed boy in the school, or in two or more schools. The taking of the photographs of the winners, in tights, and putting them permanently on the walls of the school, is a very great stimulus.

But let it be distinctly understood that no exercising indoors can ever be used as a substitute for outdoor active play. It should be seen to that children have a great deal of healthy outdoor exercise, in overseen games and plays, and that they go on occasional long walks or "hikes." When a boy is well developed all over, or when a boy has finally made up any defect he may have had, and become first-class, then all influence should be brought to bear to have him take interest in the great outdoors. While he is doing his special exercises at home in the morning upon rising he should be having his out-of-door play in the afternoon. The fact is that when a boy has acquired a good breathing capacity and adequate muscular development, he will naturally take up outdoor plays or can be encouraged to do so easily.

So while many of the following exercises are suitable for class or group work, any of them can be assigned for special individual work. They are suitable for girls as well as for boys.

The Chest

Exercise No. 1. To increase the chest capacity. Not to be continued after a child has reached the first-class expansion for his type and height. Unfortunately this cannot be put in cubic inches

because spirometers are not generally possessed by schools.

Stand erect, with heels together, shoulders squared. Raise the arms straight overhead, take as large a breath as possible; then, holding the breath, lower the arms till they are at rest; then exhale. Remember that the breath is to be held until the arms are hanging down by the sides. This exercise, done a dozen times in the morning, in good clean air, will make a marked improvement with an under-developed chest. Bringing the arms down makes a slight pressure which forces the air to all parts of the lungs.

The common exercise in which the air is exhaled as the arms are brought down will do for children who have a normal chest development.

Exercise No. 2. This is done while the child is walking. Breathing exercises in the usual classroom with the usual stale air cannot be of great benefit. So this exercise can be done in the school yard, or, in individual work, while the child is walking at any time outdoors. At each step take in a little breath, so that by the time five steps have been taken the chest is filled to its capacity. Hold for several steps, exhale, and begin again. Continue three or four minutes.

This, with No. 1, will aid in rapidly bringing up an under-developed chest.

The Shoulders

Exercise No. 3. This and the following two exercises are to be used when the shoulders stoop forward and when the shoulder blades are prominent. The first two are excellent exercises for the whole back as well as for the shoulders.

Lie face downward upon the floor with the arms stretched ahead of you, the hands being separated about two feet. Slowly raise the hands, head, and shoulders from the floor as high as possible (the process taking about three seconds); then return, absolutely relaxed, to the first position. Continue until you begin to feel tired.

A child may tire, at first, after two or three motions.

Exercise No. 4. This is a "pretend" exercise. Great good is gained by putting the mind upon the work being done. In this case one set of muscles acts against another set, to their mutual benefit. "Pretend" that you are going to lift a heavy weight up over your head. Put your feet a foot or so apart to get a good brace; bend down and grasp the imaginary weight, slowly, using all your strength; lift it in a vertical line until it is as high as you can reach, with your arms stretched above you, your shoulders squared and chest out. Then come down, absolutely relaxed, and repeat until you *begin* to feel tired.

Exercise No. 5. This is another exercise wherein one set of muscles acts against another set. Place your tightly closed fists about six inches apart before your chest, your elbows extending horizontally on each side of the body. Slowly, keeping the arms and shoulders as rigid as possible, move the fists upward in a circle until they go back past the ears as far as you can pull them. This must be done slowly, using your strength, the process taking three or four seconds. Then relax and bring the fists to the first position, and repeat until you begin to feel tired.

The Back

Exercise No. 6. Exercises Nos. 3 and 4 are, as has been said, good back exercises. The following is another, and a "quick motion" one. Place feet together and lean forward and downward, the hands hanging straight down; then quickly swing the arms straight up overhead and take a step forward with the right foot, then down. Repeat, putting the left foot forward.

Quick-motion exercises have a value in their stimulating effect, affecting the breathing, the circulation, and the digestive organs.

The Abdomen

Exercise No. 7. These are exercises requiring considerable strength and bringing a fair strain on

the abdominal muscles. When the abdomen is weak exercise No. 7 should be used alone, Nos. 8 and 9 being used when the muscles become harder and more capable.

Lie flat on the back, hands at side, feet together. Slowly raise the right leg to the vertical, slowly put it down and repeat with the left. Continue until you begin to feel tired.

Exercise No. 8. Take the position as in No. 7. Slowly lift both legs, keeping them rigidly extended and the feet together, to the vertical, slowly letting them down again. Continue until you begin to feel tired.

This may tire a child in two or three motions at first. It is excellent for a soft, protruding, or flabby abdomen.

Exercise No. 9. Place the feet under a bar or under the edge of a heavy piece of furniture; take a position as in No. 8, and slowly raise the body, keeping the back straight, to a vertical position, slowly going down again. Continue till tired.

The Sides

These exercises, of course, affect the main abdominal muscles as much as they do the sides—so called.

Exercise No. 10. This is a “quick-motion” exercise. Lean forward with arms hanging down

much as in No. 6, only twist around to the left, so that the hands instead of being in front of the feet, are above the side, let us say, of the left foot. Then quickly swing upwards and around, with a twisting motion, till, when the hands are overhead you are facing almost directly to the right; continue several times and repeat, swinging upwards to the left from the lower right.

Exercise No. 11. Lie on one side, keeping the body and legs in a straight line, resting upon one elbow as shown in the illustration. Then slowly lift the hips from the ground as high as you can, keeping on one side, one foot being on top of the other. Continue until you begin to feel tired; then turn over and make the same number of motions up and down on the other side.

This is a fairly "strenuous" exercise and care should be taken not to have a child continue beyond the first feeling of fatigue.

Exercise No. 12. This is a continuation of No. 11. When the hips have been raised as far as possible, raise the upper foot also as high as possible; then bring back the foot till it rests on the other foot, and then bring the hips down to the floor.

It should be understood, by this time, without further repetition, that these exercises are to be continued till the child begins to feel tired. Our sensations can be trusted on most occasions.

Exercise No. 13. This is a "quick-movement" exercise. Extend the arms sideways, on a level with the shoulders, holding them very rigid. Then, holding the body rigid also, twist around to the left, then around to the right, so that you face the left and right alternately.

Exercise No. 14. Extend the arms rigidly as in No. 12, and then bend over sideways, slowly, as far as possible; then swing up and over to the other side, so that the rigid arms take up a "see-saw" motion.

The abdominal and side exercises are useful generally, but can be given particularly when the abdomen is weak, soft, flabby, or "hanging" through weakness, and the side-exercises, also generally useful, not only for the side-muscles themselves, but also for their effect on the internal organs, can be given particularly when such work is obviously needed.

The Arms

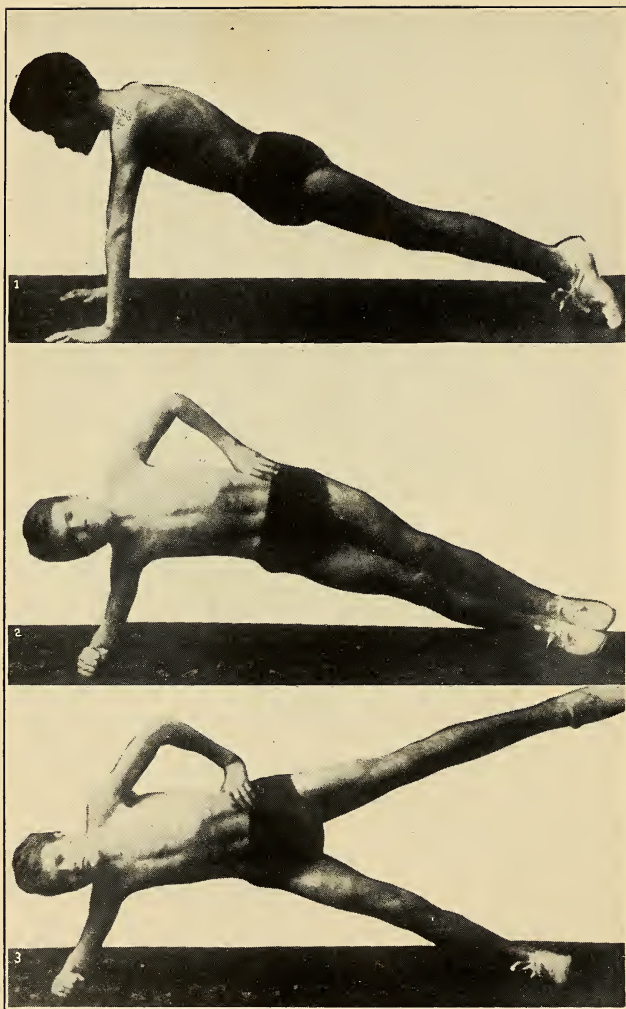
Exercise No. 15. This is an excellent exercise for all the arm muscles. Place the hands, palm to palm, in front of the chest, the right palm facing outwards, let us say. Slowly, using all your strength, push out the left hand with the right till both arms are fully extended, then, with the left hand, slowly push the right hand back to the

chest again. This exercises principally the right triceps and the left biceps. Reversing the position of the hands exercises the right biceps and the left triceps. This is a remarkably effective exercise for bringing the arm development up to standard. It should take a full second or a little more to push one hand out and as long to come back to the first position. The "imaginary" lifting exercise of No. 4 is an excellent one for the arms.

Exercise No. 16. For the forearms. Extend the arms straight ahead of you with the hands and fingers extended rigidly. Keeping the hands as rigid as possible, open and contract them slowly, taking about two seconds to close them tightly and as long to extend them fully. This can be given as general work and can be used when a child's hands are manifestly weak—an unusual occurrence, be it said.

Exercise No. 17. Extend arms as in No. 16, extending hands also horizontally, keeping fingers together. Keeping the forearms and hands as rigid as possible, turn the hands slowly down and then up, moving them as far downward and upward as possible, taking a full two seconds for a movement from down to up.

A variation of this movement consists in keeping the hands and forearms rigid as before and moving the hands in stiff circles.



NO. 1. EXERCISE NO. 19, FINAL POSITION. NO. 2. EXERCISE NO. 11, FIRST POSITION. NO. 3. EXERCISE NO. 12, A DEVELOPMENT OF NO. 11.

The Neck

Exercise No. 18. Place the hands behind the head and slowly move the head backwards against the pressure of the hands and as slowly let it come forward again. The exercise can be reversed by bending the head forward against the hands placed with the palms against the forehead.

The same exercises can be done without using the hands at all, by making the neck rigid during the exercise, and a good variation is made by making the neck rigid and then slowly bending the head around in a circle.

The Chest Muscles

Exercise No. 19. There are two simple and effective exercises for developing the main muscles of the chest. Lie face down on the floor with your hands, palms downward, pressing on the floor right under your shoulders. Keeping the body and legs perfectly rigid, push down with your hands, lifting your body from the floor as high as possible. This should occupy a slow second, taking the same time to come down again.

This exercise should not be done unless shoulder and back exercises are done also. Many boys' shoulders stoop forward not so much because of weakness, but because the strength of their chest muscles is larger in proportion than

of those across the shoulders, so that the shoulders are pulled forward.

Exercise No. 20. Press the palms of your hands together in front of your chest, then, using all your strength, have one hand push the other slowly across the chest, then the second push the first back again across the chest to the other side. This is a slow, "resistance" exercise.

The Legs

The legs of most boys are fairly well developed, unless the boy is a "stay-at-home" who prefers to sit curled up in a corner reading a book than to play with boys of his own age. Give such a boy a strong physique and the "reflex" will soon drive him out of doors, to his great benefit.

Exercise No. 21. Stand straight, with feet a little apart, then, keeping the body erect, bend your knees till you are almost sitting on your heels, then up again. The whole process, up and down, should take about two slow seconds. If there is any heart weakness this exercise had better be done quite slowly.

Exercise No. 22. For the calves. Slowly rise up and down on the toes, going up as far as possible. When walking, walk for a hundred yards, say, coming down on the toes only.

These comprise the basic exercises which affect all the important groups of muscles, and a major-

ity are capable of being used for group work as well as for individuals.

Some of the ordinary quick-moving exercises as used for classes are valuable, the quick motion itself having a direct, stimulating effect. Such exercises are the ordinary arm movements, such as are sometimes given with dumb-bells. One disadvantage of using rapid exercises in the usual school class-room is that the physical director or teacher generally has no knowledge of the physical condition of each child. Though these exercises are undoubtedly of great value for the majority, they can do harm to the small minority which may be quite unfitted for such work.

We should all insist upon a physical and medical examination for each school child, at least twice a year, the results of which, coupled with remedial exercises and care, can be made of the very greatest value. And, when this is united with a character-making influence, as with the boys, a work of vast importance can be accomplished. Certainly a great responsibility is put into the hands of the schools, these days, and let us find them worthy of it!

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$\frac{d}{dt} \left(\frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

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